Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME XI. NEW-YORK, JANUARY 12, 1856. NUMBER 18.

THE
Scientific American,
PUBLISHED WEEKLY
At 128 Fulton Street N. Y. (Sun Buildings.)
BY MUNN & COMPANY.
O. D. MUNN, S. H. WALES, A. E. BEACH.

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Single copies of the paper are on sale at all the periodical stores in this city, Brooklyn, and Jersey City.

TERMS—$2 a-year,—$1 in advance and the remainder in six months.

A Water Wheel Railroad.

A Piedmontese, inventor, has taken out a patent for carrying railroad trains over Mount Cenis. His plan is described as follows :—

"A railway of the usual description is to be laid down in a direct line from the bottom to the top of the ascent. Between these two rails a canal is to be dug three feet nine inches in width, and about thirty inches in depth, which is to be lined and made completely water-tight with boiler plate. The motive power to be employed is a stream of water rushing down this canal. Mount Cenis, however, affords every facility in this respect. On the outside of the railway a cogged rail is to be laid down on either side. In the middle of a frame, about the size of an ordinary steam-engine without its tender, a water wheel, is to be fixed, having a diameter of twelve feet. On the same axis is to be fixed two cogged wheels to work in the cogged rails, of six feet diameter. With this apparatus it seems clear that the descending stream must force the water wheel to make revolutions towards the top of the hill, and to carry round with it the cogged wheels in the same direction. As the diameter of these is to be half that of the water wheel, the rate of ascent will, of course, be half that at which the diameter of the water wheel moves. It is calculated that the latter speed will be ten miles an hour, and the former, therefore, five. It is further calculated, that a machine of these dimensions will carry up the proposed acclivity a weight of from fifteen to twenty tuns, or say from sixty to eighty passengers. For the descent, the water wheel, moving through and against the stream, will act as a restraining force to moderate and regulate the speed."

[The above is condensed from the London *Athenæum*, which objects to the plan on account of severe frosts during winter. We, however, look upon the plan as stupidly described, for we believe the *Athenæum* does not describe the invention clearly; it confuses the account of the action of the water wheel, and leaves an impression on the mind that *it* is moved up the incline drawing the train after it, which would be a stupid impracticable plan. The invention is, no doubt, the use of a fixed water wheel at the foot of the mountain, to draw the train to the top of the ascent by a carriage and endless rope. The plan is good and economical where it can be carried out, but it is not a new invention.

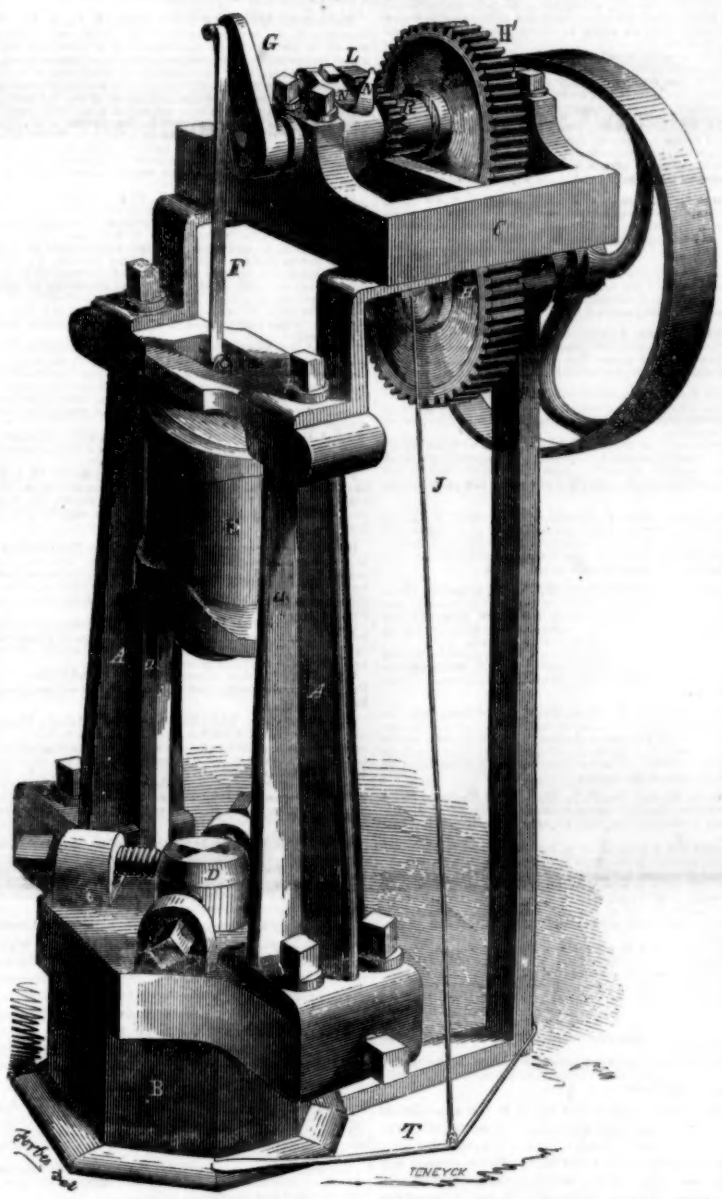
Frozen Flesh.

Mr. A. Bronson, of Meadville, Pa., says, from fifteen years' experience, he finds that Indian meal poultice, covered with young hyson tea, softened with hot water, and laid over burns or frozen flesh, as hot as can be borne, will relieve the pain in five minutes.—[Exchange

A Large Ruby.

The King of Burmah wears a ruby in the center of his crown which is larger than a hen's egg, and more valuable than the celebrated Koh-i-noor diamond. It is more than two thousand years since it was found, and is beautifully cut.

PECK'S PATENT DROP PRESS.



The accompanying figure is a perspective view of the patent Drop Press (with its recent improvements,) for which a patent was granted to Milo Peck, of New Haven, Ct., on the 28th Nov., 1851, and which was illustrated on page 140, Vol. 7, SCIENTIFIC AMERICAN.

A A are the standards, or upright ways between which the drop or ram moves. B is the bed or anvil, and D is the lower die on the face of the bed. E is the drop with the upper moving die secured in its under face. C is the frame which supports the gearing and machinery on the top of the press. F is the pitman rod attached to the drop, E. It is connected by a pin to the crank, G, on an upper shaft, which, as it is rotated, moves the drop, E, up and down, as desired. The crank has holes in it to connect with rod F, at different points from the center, to give a long and short stroke to the drop. I is the main driver shaft, having a cog wheel, H, on its inner end, gearing into another, H', on a hub, R, surrounding the crank shaft, to which it gives an intermittent rotary motion, by a rotating dog or catch, L, attached to an arm or sweep on the inner end of the crank shaft. The dog takes into the small cog wheel on the hub, R, as it rotates, and thus acts as a clutch to connect the crank shaft with the rotating hub, R, to raise the drop, E, to the top of the fall. When the drop, E, is raised to the top of the frame, a small eccentric stationary rim (not seen) fitting close to the small ratchet wheel on hub, R, throws the spring ratchet, L, out of gear, and the crank then ceases to rotate. The drop, E, is now at the head of the fall, ready to descend, but a spring catch, not shown on the upper end of the treddle rod, J, catches a sweep in the under side of the crank shaft, and holds the drop stationary at the top, while the main shaft and hub, R, have a constant rotary motion. The crank, G, however, is a little inclined from the center—as now shown in the figure—when the drop, E, is raised and caught, so that the moment the lower sweep of the crank shaft is relieved from the treddle catch, the drop, E, will descend by its own gravity. The workman, by placing his foot on the treddle, T, at once releases the catch described, which holds the sweep of the crank shaft, and then down comes the drop with its die upon the lower die, D, on the anvil, and stamps the article which may be placed upon it. The machine is entirely self-acting, excepting when the drop is made to fall, and then the operator just places his foot on the treddle for every blow he desires to be struck. The rotating ratchet, L, has a spring, N, to hold it in contact with the teeth of the small ratchet wheel, and also to give a little, to allow the ratchet to be raised from the teeth of the wheel by the eccentric rim mentioned, to throw the crank shaft and the hub, R, out of gear as the main shaft rotates. The treddle, T, is for the purpose of tripping the spring catch which holds the crank shaft sweep when the drop, E, is raised to the top of the fall. When the operator is securing a piece of work on the anvil, the main shaft keeps rotating, while the ratchet, L, being thrown out of catch with the small ratchet wheel, the crank shaft is kept stationary, with the drop, E, raised, and ready to descend, when the treddle, T, is trod upon. The mode of tripping the drop is shown and described on page 149, in the volume heretofore referred to: the devices in this figure are nearly the same for this purpose. We have briefly described these operations, however, to convey a clearer idea of the tripping action of this drop press to subscribers who do not possess Vol. 7 SCIENTIFIC AMERICAN. The ways to guide the drop, E, correctly, are differently combined in this press, and are a great improvement on the old presses. In the old drop presses the rods or guide ways, A A, of the drop rest in grooves, and are bolted to the *anvil bed*, and the yoke on top of the ways is generally secured to the frame of the building in which the press is placed. In this press the face of the anvil itself is made broad, and is planed true, whilst the foot of each way is a broad smooth flange, fitted nicely to, and bolted to the anvil instead of its bed. The yoke on the top of the ways, A A, is bolted direct to the top flanges of the ways, and the anvil, ways, and yoke, thus almost form one piece when adjusted and set. *a a* are guide flanges for the drop.

One great object to be secured in such presses is a true vertical blow of the drop, with its die, upon the die of the anvil. If the upper die does not fall true on the lower one, good work cannot be accomplished. In all common presses, the upright ways are liable to be thrown, more or less, out of the perpendicular, and require frequent adjustment, thus causing great trouble to the workmen. In the press represented in this figure, the upright ways being bolted fast to the anvil itself, and the yoke of them not being directly connected to the building in which the press is placed, if any part of the building settles, the ways, anvil, and yoke are so connected that they will not be thrown out of line with one another, consequently the press will operate with more precision, and will execute better work, and at the same time it will save much loss of time, caused by the common presses requiring frequent adjustment to make the drop strike true.

More information respecting this improved drop press may be obtained by letter addressed to Mr. Peck, at New Haven, Conn.

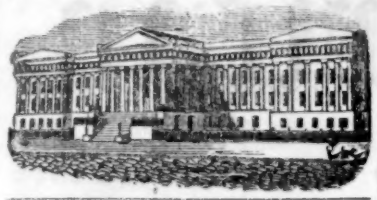
A Tall Chimney.

At Preston, England, a chimney has just been completed at the work of Messrs. John Hawking & Low, which is 258 feet in hight; its width at the foundation, 34 feet; the weight of the stone cap is thirty-one tuns, and 440,000 bricks have been used in building it.—[Exchange.

[This is, indeed, a pretty tall chimney, but not to be compared with one in the city of Glasgow, described in the December number of *Hunt's Merchant's Magazine*, page 677. Its hight is 460 feet, and its circular diameter at the base 50. It is of the form of a cone, and contracts to six feet diameter at the top. Three millions of bricks, and thirty tuns of iron for bands, were used in its construction, and cost about $50,000. It was built by Messrs. Tennant, to carry off the deleterious gases arising from their retorts in manufacturing chemicals. It is situated on elevated ground, and can be seen at a distance of 20 miles on approaching the city, from any direction. It is the tallest chimney in the world.

New Guano Islands.

A new island, containing many million tuns of guano, has been discovered in the Pacific Ocean; and it is believed that our farmers will hereafter obtain this excellent fertilizer at a much lower price.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JAN. 1, 1856.

FURNACE FOR SOLDERING—Philo Brown, of Waterbury, Conn.: I do not claim, broadly, the construction or use of a furnace for brazing or soldering metallic tubes, consisting of a brazing or soldering chamber or passage interposed between the fire chamber and chimney flue.

I claim combining the brazing or soldering chamber with the fire chamber and chimney, and interposed between the two, when the said brazing or soldering chamber communicates with the fire chamber by means of one or more apertures, at or near the top, and one or more apertures at or near the bottom, governed by dampers or equivalents therefor, substantially and for the purpose specified.

CHAIN FOR POWER PRESS—Nathan Chapman, of Mystic River, Conn.: I claim so making a chain for power presses as that it shall recede gradually from a straight line, and the links diminish in length as they extend from the wheel on which they are to be wound to the follower, which said chain is designed to work, substantially as described.

[The object of this invention is to render the great strength of chains available in the production of a variable power, adapted to presses and other species of mechanism. This is done by employing cone pulleys and winding the chains upon them, just as ropes are applied; the chains, however, will not wind evenly on round pulleys, and therefore the latter must be made with angular or prismatic sides. The chain must also be so manufactured that each link shall be of the same length as the flat surface of the cone, where the link comes in contact, is wide, thus at the apex of the cone the chain links are quite small, but they are gradually lengthened until the links that wind on the base, or larger part of the cone, are greatly increased in size. Links and pulleys made and combined as described, afford a strong, durable, and compact variable power.]

PLANING MACHINES—Hiram C. Wright, of Worcester, Mass.: I claim governing the motion of the movable feed rolls by means of the jointed levers and connecting rod or its equivalent, whereby I am enabled to keep their surfaces parallel with the middle one, and thereby feed the board on a line with the surface of the table, as set forth.

NUT BOX—Richard Cole, of St. Louis, Mo.: I claim the arrangement of the segments, c c, the eccentrics, d d, and the set screws, e f g, with each other, and with the case, A I, substantially in the manner and for the purpose set forth.

BRICK PRESSES—J. B. Collen, of Reading, Pa.: I make no claim to stationary mold boxes of themselves, nor to the use of cams in producing the intermittent action of the pistons, nor to the peculiar shape of cams.

But I claim the employment of stationary mold boxes in combination with the vertically moving gate actuated substantially as set forth, and the intermittent action of the pistons, whereby the brick is pressed and delivered by a single piston, as specified.

LEATHER SHOE BINDING—Joshua Turner, of Charlestown, Mass., (assignor to W. Covel, of Dedham, Mass.): I claim the improved process set forth in the manufacture of leather bindings, viz.: dividing a sheet of leather into strips of equal widths, joining or connecting them at their ends, so as to connect them into one long strip, coloring the same when so formed, and finally splitting it so as to remove the fleshy surplus portion, and reduce the whole to one equal thickness.

SCREW MACHINES—Cullen Whipple, of Providence, R. I., assignor to the New England Screw Company, of same place: I claim the combination of a series of grooves in a moving surface with a smooth guard and griping plate, operating substantially as described. Also the nicking saw mounted on the oscillating eccentric bearing resting in cylindrical boxes, in combination with mechanism for presenting and holding the blank, as described.

PLOWS—G. W. Cooper, of Ogeechee, Ga.: I claim uniting the handles of the plow to the standard thereof, by means of the self-adjusting elbow joint, e, so that both the handle and the plow shall be susceptible of the same relative adjustment to the beam, as described.

SAFETY GUARDS FOR RAILROAD CARS—J. G. Crocker, of Utica, N. Y.: I do not claim the first discovery of the idea of preventing accidents, by covering the wheels of railroad cars, nor do I claim the invention of any part of the car, nor any separate part of the shield or movable platform.

I claim to receive the shield and the movable platform to be attached to railroad cars for preventing accidents, as set forth, and though both are necessary to effect this purpose fully, yet I claim them separately as well as in combination, to be made and used, as fully described and set forth.

WIND MILL—Benjamin Fenn, of Hartford, Ohio: I claim the horizontal movable wing with unequal sides, and hung upon eccentric pivots, in combination with the governor, H, arranged in the manner and for the purpose set forth.

I claim also the method of governing and releasing the wings in high winds by means of the pendulum, J, and rod L, in combination with the wheel, or counter balance, E, as described.

PRINTING PRESS—G. P. Gordon, of New York City: I do not claim, separately, a rotating disk, W, for distributing the ink.

But I claim, first, combining with such rotating disk, W, an annular disk, X, which shall revolve around and in a contrary direction to it for such purpose.

Second, I claim throwing the same rollers, T, one or more, used for inking the form, from the parallel position they necessarily occupy for this purpose, to an oblique position, which shall give to them a lateral motion, when in contact with the distributing disks or equivalent for the purpose specified.

Third, I claim a rotating reciprocating cylinder, R, or segment of a cylinder, in combination with a reciprocating bed, N, when such bed shall have a movement to and from such cylinder or segment of a cylinder in the manner described for the purpose specified.

Fourth, I do not claim placing a reciprocating bed in a vertical position or in any given angle from a horizontal position; but I claim so placing the bed when used with a rotating reciprocating cylinder or segment of a cylinder, which shall drop or pile the printed sheets underneath it, in the manner specified.

[The foregoing invention is perhaps as well described in the claims as it can be without diagrams. Mr. Gordon is a well-known practical printer of this city. He is the originator of several very successful and important improvements in printing machinery.]

REPEATING FIRE ARMS—Benj. Groomes, of Cumberland Township, Green Co., Pa.: I do not claim the method of loading repeating fire-arms, by placing a number of cartridges one upon another in a separate cylindrical chamber, as such has been done before; neither do I claim revolving hammers for exploding in succession the different percussion caps of repeating fire-arms, as such have been used before, though actuated by means other than I employ.

I claim the mechanism for rotating the hammer during its reciprocating rectilinear movements, or rearward motions, as described, consisting of the spring dog or stud, the series of straight grooves and the series of helical grooves formed in the hammer shank, and arranged with respect to each other, so that the spring dog may operate on them, substantially as specified.

SPOKE SHAVE—Elijah Holmes, of Lynn, Mass.: I do not claim the manner of fastening the knife, viz., by a single screw clamp, chamfers, and sockets.

But I claim supporting the ends of the knife or planes on shoulders inclined or arranged with respect to the bearing of the stock, substantially in manner as specified, and so as to enable the distance of the cutting edge of the knife from the said bearing surface to be changed, in the way and for the purpose as explained.

SHIRT COLLARS—Walter Hunt, of New York City: I claim, in the manufacture of shirt collars or sham shirt collars, uniting only the extremities of the lower edges of the side pieces, b b, to the neck band, d, by means of any suitable fastenings, for the purpose of enabling a flat sided collar to fit easily and gracefully about the face, substantially as set forth.

PEGGING BOOTS AND SHOES—W. B. Johnson, of Sandwich, N. H.: I claim, first, the vibrating jaws, g h, constructed and operating substantially as described, for feeding the shoe, whether actuated in the manner set forth or in any other way which will enable them to perform the aforesaid function.

Second, the combination of lever G, stop, x, and swinging jack, constructed, arranged, and operating substantially as specified, for submitting the surface of the sole to the awl to a given angle, in every position, substantially as set forth.

Third, the adjustment of the drivers on the perimeter of the cam, substantially as and for the purposes set forth.

Fourth, the double binding slide clamps for securing the last in the jack, constructed and operating substantially as and for the purpose specified.

GOLD AMALGAMATOR—Daniel Leibee, of Middletown, Ohio: I claim the use of the reservoir and spout in connection with the revolving pan and scrapers, operating with the stationary trough and agitators, constructed and arranged in the manner and for the purpose as set forth.

PUMP—C. N. Lewis, of Seneca Falls, N. Y.: I claim the basin, C, or its equivalent, for the uses and purposes set forth, and in combination and connection therewith I claim the arrangement and construction of said pump, as specified.

EAVE TROUGHS—O. E. Mallory, of Castile, N. Y.: I claim the use of the semi-cylindrical shaft, b, metallic sliding bar, d, and the end rollers, e, constructed, arranged, and operating as set forth.

STEAM BOILER ALARMS—Thos. Stubblefield, of Columbus, Ga.: I claim the combination of the flexible lever with the float and alarm valve, substantially in the manner and for the purpose set forth.

LATH SAWING MACHINES—T. R. Markillie, of Winchester, Ill.: I disclaim the employment of the two systems of saws perpendicular to each other, such forming no part of my invention.

I claim the combination of the bed, m m, with the longitudinal bearing guides, i i', arranged and operating as and for the purposes set forth. Also the construction of the conformable dogs, E, operating as and for the purposes set forth.

SASH LOCK—Joseph Marsh, of Rochester, N. Y.: I claim the construction and arrangement of the plates, C and D, the lever, A, and bolt, B, said bolt having the secondary locking notch at d, operating in the manner and for the purpose substantially as described.

PUMP—James Neal and C. W. Emery, of Boston, Mass. We are aware that the lever or levers for working the piston rod of a pump have been supported either on the pump barrel or on a rotary cap plate fitted on the top of said barrel: we therefore do not claim such.

But we claim supporting the said brake posts by means of an annular ring made to encircle and rotate on the neck of the base plate, and be screwed or fastened to it as described.

SMOKE HOUSES—M. W. F. Kendall, of Cincinnati, O.: I claim the smoke furnace, or its equivalent, and its application to smoke houses thereof, which will prevent the fire from reaching the meat, or the grease from reaching the fire, thereby preventing damage and destruction to the meat and smoke house.

SEWING MACHINES—P. L. Slayton, of Madison, Ind.: I claim, first, the horizontal motion of the needle and shuttle box combined, at any required distance from the cloth.

Second, the combination of mechanism by which the pattern receives motion and operates to control the movements of the needle and shuttle, consisting of the worm wheel, L, and screw, J', or their equivalents, of which the screw or their first mover is furnished with arms, b' b', operated upon by a lever, o2, on a shaft, S', which receives a continuous rotary motion, substantially as described.

Third, though I do not claim a circular shuttle box or raceway and revolving shuttle, I claim furnishing the revolving shuttle with a revolving bobbin or ball, F, containing the thread and spool, N, by which the twist of the thread remains unchanged, or their equivalents.

Fourth, I claim the manner of connecting the fly, f, with the feeding hook, h, as it is so operated upon by the thread, as the shuttle passes through the loop to prevent missing stitches.

Fifth, the feeding apparatus attached to the revolving turn-table, I', and otherwise arranged and combined, substantially as described.

[This sewing machine is adapted to the execution of embroidery work of all kinds, and the sewing of button holes,—two very important branches of needle industry. Without engravings it would be useless to attempt any further description of the invention than is embodied in the claims. The combination of parts and the mechanical movements are ingenious and peculiar.]

HAY AND COTTON PRESSES—Joseph Peavy, of Pasadumkeag, Me.: I make no claim to the mode of operating the pressing arrangement, nor, broadly, the result due to my construction as other devices have been employed to effect the purpose.

But I claim the combination of the laterally moving beam, B, with the swinging follower, I, arranged and operating, as and for the purposes specified.

AUTOMATIC ELECTORAL CIRCUIT BREAKERS—Chas. Robinson and C. T. Chester, of New York City: We do not claim the circuit wheel, as a method of breaking and closing electric circuits mechanically, nor do we claim any peculiar use of these interruptions of circuits for ringing or recording signals; nor do we claim the use of clock work for operating a break circuit signal wheel and regulating its motion, as that is not new; nor do we claim the matter of making the break circuit signal wheel stop at a point where it shall leave the circuit closed or at a point where it shall leave it open, since, in the apparatus described in Silliman's Journal, second series, Vol. 13, the break circuit signal wheel is made to rest at the desired point for leaving the circuit closed, by the weight of its crank.

But we claim the manner in which the detent of the clock-work is let down to take effect, viz., by means of the lever, G, pushing back a spring, e, which previously held the detent in its elevated position.

VELOCIMETERS FOR VESSELS—Ira F. Thompson, of New York City: I do not claim the water leaking pistons in themselves, as they have before been used for checking and stopping vibration in other indicating instruments.

But I claim, first, the combination of a water leaking piston or pistons with the drag, b, in the manner substantially as specified, whereby the drag being hinged at or near the bottom of the vessel indicates by its inclination the speed of the vessel, and said water-leaking piston or pistons act to prevent a sudden motion to said drag as the vessel pitches, as specified.

Second, I claim the method described of communicating motion from the drag or paddle, b, to an indicator, by means of the link, d, guided and retained vertically by the arm, e, substantially as specified.

GRAIN BINDERS FOR HARVESTERS—G. W. N. Yost, of Fort Gibson, Miss.: I claim the double reciprocating compresser, a', for gathering and compressing the grain against the stationary compressers, a a, ready for binding, operating and operated substantially as described.

TREATING WOOL—Andrew H. Ward, Jr., of Boston, Mass.: I do not claim the employment of ordinary oils, or the mixture of crude oily acids, called red oil, for oiling and cleansing wool and goods.

Nor do I claim the use of a nearly pure oleic acid in the treatment of wool, nor its subsequent removal by alkaline carbonates only.

But I claim the employment of neutral salts, as specified, with the alkaline carbonates and the oleic acid, for the purpose and to produce results as stated.

HARVESTERS—J. H. Manny, of Rockford, Ill.: I claim the tongue with an adjustable joint, constructed and operating substantially as set forth.

PADLOCK—I. J. Oldis, of Wheeler, N. Y.: I claim the use of spring catch, E, and lever, D, arranged and operating in connection with the lips, d d, and springs, c c, as set forth.

[The above lock is intended to combine the advantages of safety and cheapness. It is supposed to be "pick proof." The shackle is held by a spring bolt, and also by a spring catch, both of which enter the eye of the shackle together, but must be removed separately before the lock opens. You turn the key in one direction to push back the bolt, and reverse it in order to remove the catch; the shackle is now unfastened and may be opened; shut the shackle and the lock fastens of itself. There are two key holes—a real and a false; it would take a stranger a long time to find out which was the right one. The foregoing appears to be an excellent improvement.]

REPEATING MAGAZINE FIRE ARMS—J. C. Smith, of Camden, N. J.: I do not desire to lay claim, or confine myself to the exact process described of inserting the cartridges into the magazine, or to the exact shape shown of the casing, G, or to the number of cartridges or caps contained in their respective reservoirs, as these features may be altered to suit the size and nature of the fire arms.

Neither do I desire to claim the use of a laterally radiating breech, as such is claimed in the patent of W. W. Hubbel, July 1st, 1844. Neither do I wish to claim exclusively the combining of the hammer with the laterally swinging chamber, for the purpose of effecting the simultaneous opening of the chamber and cocking of the hammer.

But I claim, first, the trigger, N, with its spring, l, link, P, lever, w, with its dog, Q, and projection, V, the hammer, S, with its notch for receiving the dog, its projection, u, and spring, T, the lever, 4, link, l, with its spring, m, lever, M, link, K, and lever, I, or the equivalents to the above, in combination with the vibrating breech, C, the whole being constructed and arranged substantially in the manner set forth, for the purpose of imparting to the said breech the required lateral vibrating movement, retaining the same when required, and operating the hammer so as to discharge the load by simply operating the trigger only.

Second, the magazine, B, containing the cylinder, W, with its hollowed flanges and spring catches, 5, in combination with the ratchet teeth on the cross piece, 6, and the ratchet wheel, e, on the end of a vibrating breech, so that the movements of the latter may cause the said cylinder to carry round in succession the cartridge ready for insertion in the chamber of the breech.

Third, the sliding rod, V, with its rod, Z, and projection, 8, for the purpose of allowing the operator a ready means of inserting the cartridge into the chamber.

Fourth, The cap reservoir, 2, with the cylinder, 11, and its orifice, for receiving the caps in combination with the rod, 10, arranged substantially as herein shown for the purpose of readily placing the cap on the nipple of the breech.

HYDRO-PNEUMATIC PUMP FOR DIVING BELLS—Geo. Williamson, of Brooklyn, N. Y.: I claim, first, the arrangement and combination of the pump cylinder chamber, b, and their valve arrangement, by which a proper supply of water is kept up and the air pumped, as specified.

I also claim refrigerating the air by extracting the caloric therefrom after it has passed the pump, by means of the water bath surrounding the valve chamber and eduction tubes, substantially as set forth.

I also claim the float reservoir connected with the eduction pipe for separating the water from the air, as specified.

TREATING OILS—Philo Marsh, of South Adams, Mass., (assignor to Marsh & Howland, of South Acton, Mass.: I am aware that acids have heretofore been used for clarifying oils, but my process does not rest on the use of acids alone, nor do I claim such.

I claim, for the purpose of defecating oil, the employment, in manner substantially as described, of the pyroligenic constituents of crude pyroligneous acid except the acetic acid.

HARVESTER RAKING APPARATUS—Geo. A. Clarke, of Philadelphia, Pa., (assignor to William Clarke, of same place): I claim operating the rake, M, by means of the endless belt, Q, in combination with the levers, R W, connected with the rods, y, as shown, for the purpose of raking the cut grain from the platform, X.

[The cutters are operated by means of a wheel placed in an angular position upon the driving shaft, so that when the wheel revolves it has a wabbling motion and vibrates the cutter bar back and forth. There is a clutch arrangement so connected with the cutter bar and the wabbling wheel that when the cutters become clogged up from any cause, the wabbler and cutter bar are at once disconnected, and the machine ceases to work, thus preventing breakage. These parts are self-acting in their operation. Altogether this improvement is an ingenious one.]

OPERATING AND LUBRICATING SLIDE VALVES—Jas. Cochrane, of New York City: I claim, first, moving a vibrating flap or curved slide valve within its chest, without the necessity of a stuffing box, by the means or similar ones to those described.

Second, I claim, substantially, the method of lubricating slide valves, as described, by and through an aperture of the valve or its seat.

RE-ISSUE.

PLOWS—Samuel Hurlbut, of Ogdensburgh, N. Y. Original letters patent, No. 10,031, dated Sept. 20, 1853. Patented in Canada, Sept. 20, 1852: I claim constructing a mold board and molding part of the share of a plow so that a horizontal line drawn at any hight across their working side shall describe a convex of a circle, and any line drawn across its working side at right angles to the base shall also describe the convex arc of a circle separately or connectedly, the whole or either part, substantially as set forth.

DESIGNS.

HALL PENDANTS—Samuel B. H. Vance, of New York City, (assignor to Mitchell, Baily & Co., of Conn.)

HALL PENDANTS—Samuel B. H. Vance, of New York City.

Deep Artesian Well.—Heat of the Earth.

A brief discussion has been maintained on the above subject in the Newark, N. J., papers, by Seth Boyden and another correspondent signing himself J. P. The former takes the ground that the center of the earth is not a molten mass, according to the theory maintained by Prof. Silliman and the great majority of geologists; while the latter endeavors to sustain the Plutonic theory. In Mr. Boyden's communication to the *Newark Mercury* of the 31st ult., he states that he had received a communication from Messrs. Belcher, of St. Louis, Mo., respecting their artesian well, which is the deepest in the world, being about 2,200 feet deep, and still progressing, while the celebrated artesian well at Grenelle, France, which was believed to be the deepest, is but 1797 feet deep. The water of this well at St. Louis contains minerals in solution, and is unfit for sugar refining, but by boring still deeper, hopes are entertained that pure water will be found. The temperature of the water at its bottom cannot be obtained on account of a great vein which flows rapidly in at 1480 feet of its depth—down to this point its temperature gradually increased to 63 degs., but below this, Mr. Boyden is positive it will not increase in the same ratio.

Mr. Boyden has forwarded us the above-mentioned letter, accompanied with a diagram of the well, from L. Holm, the foreman of Messrs. B., showing the strata which has been penetrated in reaching its present depth. The first stratum was twenty-eight feet of limestone; the second two feet of shale; the third, two hundred and twenty feet limestone; the fourth, fifteen feet of cherty rock; the fifth, eighty-five feet of soft limestone; the sixth, thirty feet of shale; the seventh, seventy-five feet of limestone; the eighth, two feet of shale, the ninth, thirty-eight feet of limestone; the tenth, five and a half feet of blue sandstone; the eleventh, one hundred and twenty-eight and a half feet of limestone mixed with sand; the twelfth, fifteen feet of red marl; the thirteenth, 30 feet of shale; the fourteenth, fifty feet of red marl; the fifteenth, thirty feet of shale; the sixteenth, one hundred and nineteen feet magnesia limestone; seventeenth, sixty-six feet of shale; the eighteenth, fifteen feet of bituminous marl; the nineteenth, eighty feet shale; the twentieth, one hundred and thirty-four feet of limestone; the twenty-first, sixty-two feet cherty rock; the twenty-second, one hundred and thirty-eight feet of limestone; the twenty-third, seventeen feet of shale; the twenty-fourth, twenty feet limestone; the twenty-fifth, fifty-six feet shale; the twenty-sixth, thirty-four feet limestone; the twenty-seventh, one hundred and forty feet white soft sandstone; the twenty-eighth, one hundred and ninety-three feet hard red sandstone; the twenty-ninth, one hundred and seventy-one feet of sandstone with thin layers of clay; the thirtieth, two hundred feet of limestone and sandstone. The size of the bore is nine inches to about half the depth of the well, then three and a half inches to the bottom. The boring was commenced in 1848, by hand; in 1851, at a depth of 456 feet, a steam engine was employed. The work has not been steadily conducted, but was stopped for some months every year, and altogether since 1854; but it is to be proceeded with again. The temperature of the water which flows out is 72 degs., and the great vein at the depth of 1480 feet is strongly impregnated with sulphuretted hydrogen. The cost for boring this well has been about $10 per foot, or $22,000 altogether. We can congratulate "young America" in having the deepest artesian well in the world, and as he has an unlimited amount of enterprise and stamina, we trust he will bore down to such a depth as will practically settle the central heat hypothesis forever.

The following are Mr. Boyden's views in opposition to the central heat theory: "The rapid increase of temperature as we descend into the earth in its polar parts has been offered as evidence of a high temperature at the center.—But knowing that the heat can only leave the earth at the surface, and that the motion of heat by conduction is extremely slow, we readily see that the general temperature of the mass is at no great distance from the surface in this latitude, and when careful examination is made, I believe it will be seen that the temperature increases faster at one thousand feet deep than at two thousand feet deep, and that the temperature decreases as we descend into the earth in its equatorial part."

Steel Manufacture at Pittsburg.

There is in Pittsburg an establishment called "Eagle Steel Works," manufacturing cast steel of all varieties, bar, shear, and sheet. They have three converting furnaces, five heating furnaces, and eighteen melting furnaces. They employ about sixty hands, many of them imported from England, and consume annually seven hundred and fifty tuns of iron, one-third of which is Swedish. The steel produced by these works has been repeatedly tested, and is found fully equal to the best English imported.

Dr. Luther, astronomer at the observator of Bilk, near Dusseldorf, Germany, has discovered a hitherto unknown star in the constellation of Pisces. It is to bear the name of "T Piscium."

The Democratic Tendencies of Science.

The *College Review* for January contains a paper read by Prof. Olmstead, of Yale College, on the above-named subject, before the American Association for the Advancement of Education. We like the spirit that pervades the entire article, and are happy to see that its distinguished author agrees with us in those views respecting the elevating tendencies of science and invention which have been presented on various occasions through these columns.

In an article on page 253, Vol. 6, SCIENTIFIC AMERICAN, entitled "Knowledge is Democratic," we used the following language: "We talk of this and that influence levelling the mass of men upwards, but the great elevator and democratic reformer, is knowledge." On page 325, same volume, is an article entitled "The Recognition of Genius and the Industrial Principle," we used the following language:—"Men are now becoming something for what they have done and for what they can do, not for what their fathers were. The aristocratic principle is the *past* principle, the industrial is the *present*. The Great Exhibition in London, although devised by a Prince, in the broad democracy of its management, is a recognition of the aristocracy of genius and the industrial principle." The experience and observation of Prof. Olmstead corroborate the correctness of these views. He says, "The inventions of science tend to elevate the masses and to produce social equality. Such, I aver, has been the actual effect of the changes which the inventions of science have brought about in our own country within the last fifty years, —a period distinctly within my own recollection. These changes have been chiefly effected in the following way: first, by *improvements* in the arts of *locomotion;* secondly, by the general *diffusion of intelligence*, especially through the medium of newspapers; thirdly, by an extraordinary multiplication and cheapness of the conveniencies and elegancies of life." These premises the Professor elaborates in a clear and graphic manner. Of Connecticut, the field to which his observations were mostly confined, he says:—

"Before the introduction of steamboats and railroads, there were great distinctions maintained between the professional and industrial classes, and between men of wealth and what are called 'the common people,' especially in their modes of traveling. The gentlemen in coaches were looked up to as a superior class of people, with whom those in wagons or on horseback could not presume to claim any acquaintance, or to have any, except the most formal intercourse, and those in coaches claimed the principle of caste, &c. . . This anti-republican distinction is nearly obliterated in our State, and the separation is not now into the upper and lower classes, but into the virtuous and vicious—the industrious and the indolent. If we enter a railroad car we meet with people of different vocations, but we recognize no appearance of caste."

After presenting this idea more fully, he says, "the facts which have been adduced are sufficient to show that something has, within the last half century, greatly extended the privileges and enjoyments of the masses of our countrymen, and produced a far greater equality in the social condition of the laboring in comparison with the wealthy classes, and vastly augmented the intelligence and respecta bility of the country."

He then asks the question, "Has science produced these results?" and answers, "I do say that these happy changes have been the true and legitimate results of science."

Speaking of great inventors, however, we think Prof. Olmstead holds up those who were college-bred scientific men too exclusively, by not saying enough respecting those who have done so much to advance science and art, and who labored under the disadvantages of a very limited education. Thus he speaks warmly of Eli Whitney and Morse as "Sons of Yale," and then describes the benefits conferred upon cotton and linen manufactures, by the discovery of bleaching, but merely says, "This immense improvement in the art of bleaching was a present which chemistry made to the arts." And who made this discovery in chemistry, let us ask? Scheele, a French chemist. He discovered that chlorine could bleach vegetable productions with great rapidity; but so can ozone, and why is it not generally used? Simply because an inventor has not yet arisen to do for ozone what Charles Tennant, a working mechanic, did for chlorine gas, viz., make it available and economical for common use.

But Prof. Olmstead, we believe, would not wilfully depress the merits of one inventor to exalt those of another, whether educated in a college or at a counter. His heart is right on this great question, "the democratic tendencies of science!" Such sentiments as he has expressed, coming as they do from "Yale," fill us with unaffected pleasure.

Locomotive Telegraph.

We have already noticed in former numbers of the SCIENTIFIC AMERICAN, that M. Boneli, of Turin, Italy, had invented a method of telegraphing in a railroad train running at any speed. His first experiments were tried on a locomotive running on a line of railroad in Sardinia, and were stated to be very successful. He has recently made some experiments in France, especially one on the St. Cloud and Paris Railroad. Instead of the ordinary telegraphic wires, he placed a thin half-inch iron band or ribbon along the center of the track, between the two rails, and pinned it to insulators about two inches above the ground. The telegraph apparatus was placed in the locomotive, and by touching a key, a metal spring was brought into contact with the band or conductor along the track, and thus closed and broke the circuit with the battery, thereby writing messages in the locomotive while running as easily as could be done in a house.

The experiments were performed in presence of the French minister of public works, and a large number of scientific gentlemen, amongst them several Americans. A train was first sent on in advance, presently followed by a second, which latter stopped and commenced an interchange of signals with the first train, still in motion. The signals were made and replied to with equal facility, as under the ordinary conditions between station and station. Bye and bye, the first train despatched orders to the second to follow it and in this postion, both trains proceeded at full speed, a constant exchange of signals was kept up without difficulty, and with the greatest precision. In less than twenty minutes forty questions were asked and replied to.

Receipts of the Paris Exhibition; American Reapers.

The report of the general receipts of the late Universal Exhibition in Paris has been published, from which it appears that the number of persons who visited the Palace of Industry, during the one hundred and ninety-eight days it remained open, exclusive of the days of opening and closing, was 3,626,934, out of whom 4,617 were holders of season tickets. The whole number of visitors slightly exceeded four and a halt millions, and the receipts fell a little short of three millions of francs. The French Exhibition, in a pecuniary point of view, has proved a failure by comparison with that of London, where the receipts amounted to about twelve millions of francs, and the net profits to about half that sum.

La Presse, the most extensively circulated newspaper in France, has devoted no less than four columns to a historical sketch and minute description of McCormick's reaping machine with an account of the extraordinary results obtained in all the recent trials before the international jury; and it bestows great praise on American inventions generally.

Wind Flouring Mills for the Prairies.

The Peoria (Ill.) *Transcript* is informed that the Rochester (N. Y.) Mill Erecting Company intend to place in operation fifty mills on the western prairies during the year 1856, the motive power of which is to be the wind alone. The *Transcript* adds:

"We hear a company is to be organized in Peoria for the immediate establishment of one of these windmills. We understand that the cost of a windmill in operation with two run of four-feet stones is only $5000. That includes the cost of building, machinery, and every requisite, including the right to use the patent. One on this plan is now in operation at Rochester, N. Y., and with two run of stones thirty bushels of grain are ground in an hour. The running of the mill by wind power is ten months in the year, about the average time of steam power, deducting repairs, &c., and more time than most of the water mills. It is represented to be just what is wanted on the prairies."

[So much for the improvements made during the last few years on the old windmill, and all coming from suggestions made through our columns.

A New Perpetual Motion.

A new perpetual motion is astonishing the wise people of New Haven, Conn. The *Register* says, "Mechanics are flocking from all directions to see Perpetual Motion—the invention of a gentleman of this city. All concur in the opinion that it is a wonderful piece of machinery. There is no cheat or collusion about it, no trick, but it is a self-moving, power-supplying machine, which will run until it is worn out. As such, it is a triumph of ingenuity. The inventor is an accomplished mechanic, who has spent years in perfecting it, whilst confined to his house by ill health."

The *Palladium* says that "the machine certainly goes, and there is no chance, as anybody has yet discovered, of its being moved by any extraneous or concealed force."

A correspondent of the *Courier* thus describes it:—"I have been an inventor for several years, and have been taught, by a long series of experiments and practical investigation, to believe that what is possible man can accomplish. I was not surprised when I saw the announcement in your journal recently of the apparatus invented by Mr. E. P. Willis, purporting to be a perpetual motion, although there are thousands who do and will treat it with disdain, or as a thing impossible. The great secret is the particular and double inclination of the main wheel and gravitation. In all former attempts at a perpetual motion, the great object has been to overcome gravitation, but in this instance, without gravitation the machine would stop. The driving wheel being on an inclination of 23 1-2 degrees, is the particular degree at which all metallic bodies which are placed on its disk will retain their position through the effects of gravitation, and if the shaft is adjusted at 24 degs., those bodies will cease to act and slide off; or if the wheel is inclined to 23 degs. there will not be sufficient power to cause the cylindrical weight to pass the eccentric wheel which is attached to the shaft supporting the fly wheel.

Another very nice adjustment of the driving wheel is its adjustment of a vertical shaft out of line 1-8 of an inch, and as the principle on which this machine acts will work both ways, it is only necessary to shift the step 1-4 of an inch to reverse the motion."

[If, according to the *Register*, this is a *self-moving* and *power-supplying* machine, it can very easily tell us how the power is obtained, and how it supplies the *power*. If, according to the *Palladium*, it is not moved by an extraneous or concealed force, so far as has been discovered, by what force then is it moved?—Is it moved without force, or does it contain the elements of force in its mechanical parts? The description of the machine by the correspondent of the *Courier*, is as clear as mud, with the exception of one point, and that is the particular inclination of the wheel, viz.: 23 1-2 degrees. This inclination of the wheel and gravity is the secret, according to him, of its perpetual motion. If it is but inclined half a degree less—23 degs.—then the perpetual motion is killed at once, according to his description.

There can be no such thing as a perpetual motion, for no wheels nor combination of mechanism contain power in themselves to set and keep them in motion. Clocks have been constructed that have gone on for years without re-winding, but they did not contain the elements of force within themselves. They were first set in motion, and the first impulse carried on the work until they stopped. Mr. Willis does not probably claim his machine as a perpetual motion, but as a skillfully constructed machine, the moving parts of which meet with so little resistance that it requires an exceedingly minute amount of power to move them. Any body once set in motion, by the law of *inertia*, would move on forever in a straight line, without a change of velocity, were it not for the resistance of the atmosphere, friction, and the attraction of other bodies How does this machine overcome these resistances? If it does not overcome them, it will cease to operate some day.

[For the Scientific American.]

Granite Dust a Fertilizer.

I was much pleased to find an article in your paper of the 23rd inst., that "Granite dust was equal to the best manure."

In the year 1849 I published a small work of 42 pages, on agriculture, which was distributed gratis to intelligent farmers; more than 100 copies being presented to cultivators in Massachusetts. In that work I introduced granite rocks as a fertilizer, as follows:—"In traveling in the States of Maine and New Hampshire, the summer before last, I noticed the mountains to contain any quantity of pink felspar rock; and as limestone was rarely found, and I understood the same, when burned, was too costly to use as a fertilizer, I would recommend farmers to grind the felspar, and try its efficacy. I should judge, from its components, that it would form a fertilizer of no mean quality. It contains seventeen per cent. of alumina, three per cent. of lime, and thirteen per cent. of potash. I have never heard of its being used for such a purpose, but as it contains thirty-three per cent. of fertilising materials, and more potash than is contained in the ashes made from oak wood, I should consider it would be well worth a fair trial.—Any felspar, either white or colored, will be equally efficacious. I have referred to felspar more on account of its being the most abundant mineral in primitive rocks, than because it is the best. Mica contains more alumina and more potash; hornblend nearly four times as much lime, and basalt thirty per cent. of alumina, ten per cent of lime, and six per cent. of magnesia. Any primitive rock, therefore, in which quartz is not too abundant, will answer when ground, if the felspar will answer."

My opinion having been confirmed by direct experiment, I congratulate our Eastern States in possessing an inexhaustible supply of highly fertilizing materials.

WM. PARTRIDGE.

Binghamton, Dec. 24th, 1855.

Compressed Air Engines for City Railroads.

MESSRS. EDITORS—In your notices to correspondents, of the SCIENTIFIC AMERICAN Dec. 29th, 1855, you reply to "W. G., of N. Y.," to the effect that compressed air is more expensive than steam as a motive power. Obviously, this is correct as a general rule, but there may be cases where steam power is inadmissible, and then, as in the case of our city railways, the question of economy is between compressed air and horse power. I believe that the compressed air plan is a most desirable one for our city railways, in lieu of the miserable and inhuman horse-flesh one. Depots could be established at every two or three miles with powerful air pumps, keeping globular reservoirs always charged, so that the charging of long cylinders under the seats of the cars would be but the work of an instant, after the connection was made. When breaking up, the engine should be reversed, not in its rotation, but in drawing in the external air and forcing into the reservoir instead of receiving it from the reservoir, and allowing it to escape in the air.

I hope your correspondent will get upon that tract, and have your encouragement, for I am satisfied that it may be made a profitable one.

Compressed air engines are not new, for they have been used considerably on railways in England, and were called "poneys." They did not succeed there, for the reason you have assigned, but here the case is different.

THOS. PROSSER.

Brooklyn, Jan. 2nd, 1856.

[Like our correspondent we believe that compressed air engines may be economically applied to city railroads as substitutes for horse power; even if they were to prove somewhat more expensive they are preferable.

Gloves.

Belgium is the great glove manufactory of the world. It is stated that from one establishment, last year, 400,000 dozen pairs were exported to England and America. There are 3,000 hands employed there.

New Inventions.

Epidemics and their Causes.

Dr. Southwood Smith has been giving a very important series of lectures in Edinburgh, on the subject of epdemics. Dr. Smith dwelt particularly, in his introductory lecture, on the fact that all epidemic diseases—the plague, black-death, sweating-sickness, cholera, influenza, &c.—were fevers. Cholera was usually preceded, he stated, by influenza. In cholera, if the patient be saved three days, the fever and other symptoms were curable. Dr. Southwood Smith seemed to say that very active animal and epidemic poisons were generated by over-crowding of human beings, and when to this were added deficient electricity in the atmosphere, unusual prevalence of mist, haze, or fog, stillness of the air, and augmented barometric pressure, then we had an epidemic constitution of things, and would have most probably cholera.

Improvement in Seeding Machines.

The annexed engravings represent an improvement in seeding machines, for which a patent was granted to H. R. Smith, of Massena, N. Y., on the 9th of October last.

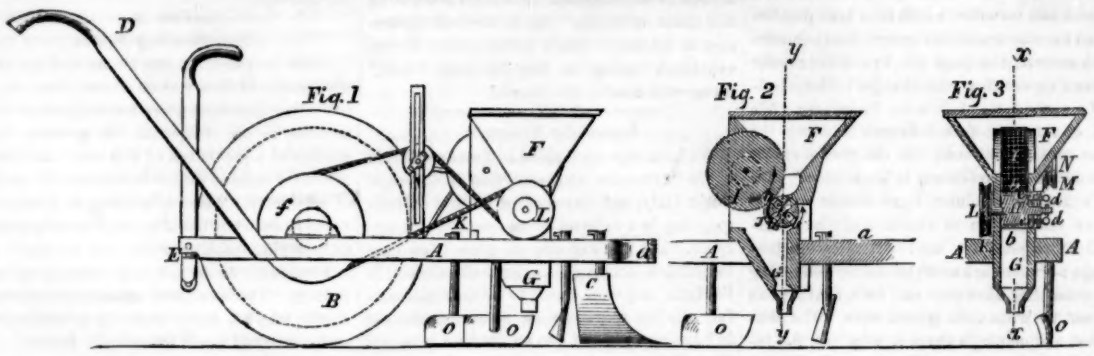
Fig. 1 is a side view of the seeding machine; fig. 2 is a detached vertical section of the hopper, and seed distributor taken at *x x*, fig. 3, and the latter figure is a transverse vertical section of fig. 2, taken at *y y*, showing the plane of section. Similar letters refer to like parts. The nature and peculiarity of the improvement on this machine relates to the means employed for distributimg the seed, which will be better understood as we proceed in the description.

A A represent two beams, the front ends of which are connected angularly to a strip, *a*, so that the two beams will be of V-form. The back parts of the beams are supported by a wheel, B, and to the strip, *a*, at the front end of the beams, there is attached a share, C, formed with two mold boards. To the back ends of the beams, handles, D D, are attached, and a brake, E, is also attached to the back ends of the beams, which brake may be made to act against the periphery of the wheel, B. F is a hopper which is secured upon the beams, A A, near their front ends. The lower end of this hopper is provided with a spout, G, which projects a short distance below the beams, A A. Within the hopper, F, there are placed two wheels, H I, one of which, H, is considerably smaller, than the other, I. The wheel, H, extends across the whole width of the lower part o the hopper, and has recesses or holes, *b*, made in its periphery. One end of the wheel, H, has a metallic plate, *c*, attached to it through which screws, *d*, pass horizontally, and the inner ends of these screws are attached to slides, *e*, which fit in the recesses or holes, *b*, in the wheel, H, as shown in fig. 3. The slides are of the exact depth and width of the recesses or holes, *b*, and by turning the screws, *d*, the slides may be made to close the recesses or holes, *b*, partially or entirely, that is, the portions of the recesses or holes that are within the hopper, for one end of the wheel passes through one side of the hopper. At the back part of the wheel, H, there is a concave, J, the ends of which are secured to the sides of the hopper. This concave is fitted quite closely to the wheel, H, but not so as to interfere with its easy rotation.

The back part of the wheel, I, projects through the back side of the hopper, F, and is placed at one side of the wheel, H, its periphery nearly or quite touching the periphery of the wheel, H, as shown in fig. 2. The width of the wheel, I, corresponds with the portion of the wheel, H, within the hopper, and the periphery of the wheel, I, is slightly corrugated. The wheel, H, is rotated by a cross band, K, which passes around a circular projection, *f*, on one side of the wheel, B, and around a pulley, L, on the journal of the wheel, H. The wheel, I, is rotated by a cross band, M, which passes around a projection, *g*, on the opposite side of the wheel, B, and around a pulley, N, on one of the journals of the wheel, I; the arrows in fig. 2 show the direction in which the wheels rotate. Directly back of the spout, G, and to the beams, A A, there are attached two covering shares, O O. These shares are formed of metal plates, the front ends of which are rounded or curved and the back upper ends are curved or bent inwards. The drill for making the furrow is placed between the share, C, and spout, G.

As the machine is drawn along, the double share, C, clears a space a foot in width with a light furrow or ridge on each side, in the center of which the drill makes a narrow furrow or mark for the seed to fall in, and the wheel, B, rotates the wheels, H I, and the seed being placed in the hopper, F, will pass into the recesses of the wheel, H, said recesses or holes being made of the desired capacity. By turning the screws, *d*, the seed is carried round by the wheel, H, underneath the wheel, I, which, as it rotates, serves to crowd or press the seed forward, filling the recesses, and at the same time preventing the clogging or choking of the wheels.—

SMITH'S PATENT SEEDING MACHINE.



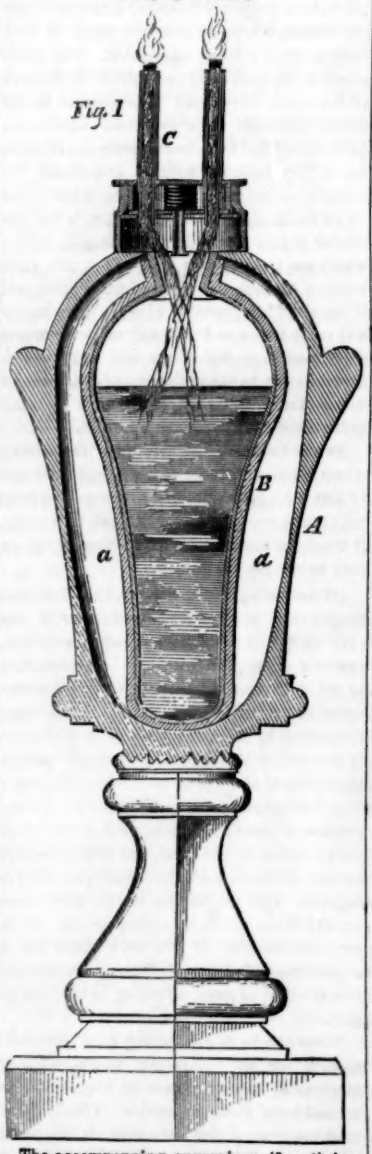
The concave, J, prevents the seeds falling in too scattering a manner as it drops through the spout, G, into the narrow furrow made by the drill, and is covered by the shares, O O said shares within the space cleared by the double share, C, and the wheel, B, passes over and presses the earth on the seed.

The seeds in a hill are not dropped in a bunch, but scattered a little, as they should be, nearly in a straight line in the direction in which the rows are planted, so that in cultivating the light furrow left on each side of the row, by the double share, C, dresses in and covers the spaces between the hills, and hills up the grain as well as it does to cultivate both ways when planted in the usual manner. The depth which the grain is covered is governed by the distance the drill and shares, O O, work below the double share, C.

The brake, E, can be made to act against the periphery of the wheel, B, so as to prevent the seeds dropping when turning around at the ends of the row, or in passing any obstacle that may be in the way. The machine is drawn by one horse, and does the work well as fast as a man can walk.

More information relating to this seeding machine may be obtained by letter directed to the patentee—H. R. Smith—Racket River P. O., St. Lawrence Co., N. Y.

Safety Spirit Lamp.



The accompanying engravings (fig. 1) is a vertical section representing the improvement in fluid lamps for which a patent was granted to Wm. Bennett, of Brooklyn, on the 27th of of Nov. last, and fig. 2 is a vertical section of the patent safety tube—for spirit fluid lamps—the patent having been assigned to the Union India Rubber Lamp Co., office No. 284 Washington st., this city.

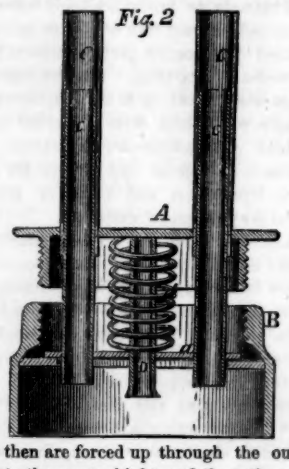
The nature of the improvement in the lamp consists in placing within an ordinary glass or metal lamp, or within a suitable frame or support, an india rubber receptacle to receive and hold the spirit gas or other fluid, said receptacle having the usual wick tubes attached to the wrench in manner.

A represents a lamp of ordinary construction, and B represents a bag or receptacle which is placed within the body of the lamp, and is made of india rubber, lined inside with a substance which protects it from the action of the fluid.

The upper part of the bag or receptacle, B, is attached in any proper manner to the sides of the orifice of the lamp, and a space, *a*, is allowed between the outer side of the bag and the body of the lamp as shown. The wick tubes, C, are attached to the upper part of the lamp so as to communicate with the bag, B. The ordinary fluid lamps, or those which burn hydro-carbon fluids, often burst in consequence of the pressure exerted against them by the gaseous substance generated within the body of the lamp by the heat of the flame. Various plans have been devised to obviate this difficulty. A metallic reservoir has been placed within the body of the lamp, and encompassed by water in order to keep the fluid at a low temperature, but this plan augmented the cost of the lamp to a considerable extent, and did not provide a perfect remedy, because the metal is liable to be crushed itself.—Vents have also been made in the upper part of the lamp to allow the vapor or gas to escape, but this caused a great waste of fluid. By this improvement the difficulty is obviated at a small cost, and without any waste of fluid, for the bag or receptacle will expand under the pressure of the gas or vapor, and consequently will not break or burst, and in case the lamp should be casually broken, the bag will retain the fluid, and prevent accidents, which frequently occur from that cause.

This improvement may be applied to any form of lamp constructed of either of the materials now employed, or the bag or receptacle may be encompassed by a framing or support, and not be placed in a lamp. The placing of the bag or receptacle within an ordinary lamp is preferable, however, and it is thus that the lamps are made.

Accidents are frequently taking place by filling spirit fluid lamps while burning, by unscrewing the cap and pouring in the fluid under it. The improved cap represented by fig. 2, obviates, for a certainty, any danger that may arise from a careless person filling a lamp while lighted, for the very best reason, the cap always extinguishes the light when unscrewed. B is the collar which is secured on the lamp. A is the cap which screws into the collar. D is a small hollow pin soldered to the underside of the cap, A; *d* is a small coiled spring around the pin, D. *a* is a small disk into which the ordinary wick tubes, *c c*, are soldered, instead of being as in ordinary lamps, soldered to the cap; the pin, D, passes through a hole in the disk, *a*, and the wick tubes, *c c*, pass through the interior of outside tubes, C C, which are soldered to cap A. When the lamp is ignited the top of the wick tubes, *c c*, are on a level with the outside tubes; that is when the cap is screwed down into its collar, B. The figure shows the cap unscrewed, and the outside tubes above the inside ones, enclosing them, and extinguishing the light, as if the lamp had been previously lighted and the cap unscrewed for refilling. Around the throat of collar, B, there is an inside ring or flange against which the disk, *a*, is pressed when the cap, A, is screwed down. The wick



tubes then are forced up through the outside tubes to the proper hight, and the spring, D, is compressed between the cap lid, and its disk, *a*. When the cap, A, is unscrewed to fill the lamp with fluid, and when the last thread is turned, the coiled spring, D, forces the disk, *a*, down, and thus the wick tubes, *c c*, are drawn into the outside extinguisher tubes, C C, and the light is at once eclipsed. This is a very simple and certain method of obviating any danger arising from replenishing the lamp with fluid. The disk, *a*, also prevents the fluid arising in the neck of the lamp to be evaporated by the heat of the cap or lid, and thus another cause of explosions is prevented, besides that of filling the lamp with the wicks lighted.

Two patents have been granted for these improvements in safety tubes, illustrated on page 24, Vol. 6, Scientific American, and the other represented by fig. 2 embracing the coiled spring and its movable disk, *a*. All these improvements are used in the construction of these lamps.

A lamp for burning spirit fluid, embracing these improvements appears to us to be perfectly safe for common use.

More information may be obtained by letter—or otherwise—directed to the Company, at their place of business given above.

Scientific American.

NEW-YORK, JANUARY 12, 1856.

Report of the Secretary of the Interior.

The annual report of the Secretary of the Interior has just made its appearance. It contains much valuable information touching the domestic relations of this government; but the portion most interesting to our readers relates to the Patent Office, and that part we accordingly annex.

The remarks of the Secretary evince, on their face, a much more fair and liberal disposition towards the Patent Office than we have hitherto supposed he ever entertained or manifested. He says that inventors are a worthy and meritorious class of citizens; thinks they ought to have the benefit of the National Gallery, &c. He glosses over with excuses his recent foray upon the premises of the Patent Office, and, having got all that he wanted, affects entire contentment from any further operations of the same sort.

We strongly suspect that the honeyed words of the Secretary are only intended to cloak some new and more dangerous assault upon the Patent Office than any he has yet ventured to assay; still, we hope we are mistaken. It is, perhaps, but fair, under the circumstances, to give him his due, and, for the time being, believe what he says. He purports to have finished all his mischief, and to be now ready to lend inventors a helping instead of an opposing hand. Let him have the chance of proving the sincerity of his professions.

He argues that the Patent Office isn't the Patent Office, because only a portion of its cost was paid out of the patent fund; therefore it was both right and proper for him to cut down its facilities and reduce its accommodations. Such reasoning is almost too absurd for refutation. As well might he say that the Capitol was not designed for the especial use of Congress, or the White House for the President. Like those edifices, the Patent Office was erected by Congress at the public expense, and set apart for an especial purpose—the transaction of patent business. By the clearest legal enactment it is devoted to this one branch of the public service, and to no other. In disregard of law the Secretaries of the Interior have converted it into an asylum for Land officers and Indian clerks.

As for the ancient and venerable Indian documents of which the Secretary speaks, we appreciate the importance of their preservation; but would it not have been better to have dug a vault in the earth and buried them safe from sight and fire?

The reasons presented by the Secretary in favor of the removal of the National Museum from the Patent Office building are sensible and strong. We hope he will continue to urge them with all the influence which his official position affords, until the change so much needed is realized. We stand ready to second his efforts in that direction by every means in our power.

We pass over the apparent self-contradiction of the Secretary in stating that his late innovation was not detrimental to the interests of the Patent Office, while in the next breath he admits, and proves conclusively that the Department is, and was laboring under great disadvantages for want of sufficient space. His arguments in favor of the removal of the Museum apply, with equal force, against all extraneous concerns existing in the building. The Land Office and Indian Bureau, for example, to use his own expression, have "no connection whatever with the Patent Office, and may as well, therefore, be placed elsewhere."

But these last changes we shall not now insist upon, it being agreed and understood that, for the future, the Secretary will behave himself properly, in regard to the Patent Office; that he will not absorb any more of its space; that he will use his best endeavors to ship off the Museum, and put the Commissioner of Patents in possession of that beautiful room, 260 feet long, and 62 feet 6 inches wide; that he will go ahead with the north wing and build it *with* a portico, never minding the expense; that he will henceforth and for ever labor hard to benefit inventors, and through them and the Constitution, to advance the prosperity of his country.

SECRETARY OF THE INTERIOR'S REPORT ON THE PATENT OFFICE—"The reorganization of the Patent Office has been perfected, and its good effect already sensibly experienced.

"Several important amendments to the patent laws were suggested by the Commissioner of Patents, in his last report, which are necessary to the more efficient action of the Bureau, and are in themselves reasonable and entirely unobjectionable.

"Since the 1st of January last there have been issued upward of eighteen hundred patents, and within the year the number will probably reach two thousand. This is the result of the judicious and excellent system that has been adopted, and which enables the office promptly to examine and dispose of every application that is presented.

"Several of the rooms in the basement story of the Patent Office building are occupied by the Indian Bureau. Previously, it was in a building not fire-proof, and much exposed to conflagration. I did not feel justified in keeping in constant jeopardy its records, files, and papers, of such immense value and importance, the loss of which would be irreparable, both in a historical and pecuniary point of view. Experience has already taught its folly, and the lesson should not be disregarded.

"Before directing the change to be made, I satisfied myself that, although it might put a few of the clerks of the Patent Office to some inconvenience, it would not materially interfere with their labors, nor essentially, with a correct and efficient discharge of their duties.

"By some it is contended that the entire building should be exclusively appropriated to the use of the Patent Office, and to this, under any other than extraordinary circumstances, I should cheerfully assent. But when I look at the fact that the entire structure, so far as completed, has cost some sixteen hundred thousand dollars, of which $1,279,700 has been drawn from the Treasury, and only $320,300 from the patent fund, and that it was impossible to secure for the Indian Bureau such a building as its necessity demanded, I could find no plausible pretext for hazarding millions of the public property, more especially when it was evident it was not absolutely necessary to the full and proper execution of the patent laws, and would not, to any great extent, incommode the Patent Office.

It will require a further appropriation to complete the west wing of the Patent Office building. The east wing cost $607,700. Owing to the declivity of the grade an additional story was required in the west wing. It was found necessary, so as to construct its basement, sub-basement, and principal story, that each might be converted into one large room when the requirements of the Patent Office demand it. To accomplish this object, marble and granite piers and architraves have been introduced, which are not in the corresponding stories of the east wing. These and other additions have cost about $100,000, and yet the whole expenditure will not exceed that of the east wing.

"The north part of the building should be commenced. The estimated cost is $450,000, without a portico. A partial estimate for its construction has been submitted.

"There is a large room in the Patent Office designated the National Gallery, which is not used for any practical purposes. It has been made the depository of the curiosities of the exploring and other expeditions, and of other rare articles worthy of preservation. If they could be removed to a more suitable place, it would be very advantageous to the Patent Office. This room is one of the largest in the building, being two hundred and sixty feet long and sixty-two feet six inches wide, and the cases it contains, as I am informed, cost some thirty thousand dollars, drawn from the patent fund. The annual charge to the Government for merely taking care of and superintending it is $3180. The room is required for the proper disposal and exhibition of rejected models, for which it is so well calculated, and was probably designed. The Commissioner could then determine which of the models could be treated as useless, and which placed on exhibition, and thus would be brought to light a set of models never seen by the public, of scarcely less importance than those now so well exhibited in the cabinets of models of patented inventions. This would be a great acquisition to inventors, one of the most meritorious and deserving classes of our citizens.

"The collection in the gallery—a very curious, interesting, and instructive one, is constantly open to, and attracts large numbers of visitors, which, in itself, is very proper; but when taken in connection with the secrecy and seclusion to which the inventions and discoveries are entitled, whilst under examination, it becomes a privilege of doubtful propriety, calculated, as it is, to disturb the employees of the Patent Office in their business, and to affect in some instances the interests of the inventors. The collection has no connection whatever with the Patent Office; and may as well, therefore, be placed elsewhere.

The appropriations for agricultural purposes have been usefully and judiciously applied. The seeds were well selected and distributed, and, from all the information received, the most beneficial results are anticipated.

Award of the Scientific American Prizes.

The pleasing duty once more devolves upon us of awarding our annual series of prizes to those friends who have most successfully labored to extend the circulation of the SCIENTIFIC AMERICAN. We annex a list of the names and residences of the fortunate competitors, together with the number of subscribers obtained by each, and the amount of prize money now their due. The sums to which they are respectively entitled are ready for payment, and will be handed over, in gold or any other currency more desired, whenever called for. Sight drafts from those who cannot make it convenient to call or send by messenger will be duly honored.

No.	Name.	Residence.	Prize.	List
I.	J. CANT,	Hamilton, C. W.	$100	172
II.	M. M. GREEN,	Louisville Ky.	$75	132
III.	J. F. LOVECRAFT,	Rochester, N. Y.,	$65	94
IV.	W. C. GRANT,	Detroit Mich.,	$55	82
V.	J. L. MITCHELL,	Jackson, Mich.,	$50	75
VI.	J. L. DICKINSON,	Dubuque, Iowa,	$45	71
VII.	G. C. HYATT,	Adrian, Mich.,	$40	66
VIII.	J. S. BARBER,	Wankegan, Ill.,	$35	61
IX.	JNO. GARST,	Dayton, Ohio,	$30	55
X.	H. S. BABBITT,	Newark, Ohio,	$25	46
XI.	C. BIERSTADT,	So' Dedham, Mass.	$20	45
XII.	J. LYMAN.	Quincy, Ill.,	$15	45
XIII.	B. RANKIN,	Louisville, Ky.,	$10	45
XIV	R. SKINNER,	Princeton, Ind.,	$5	45

It will be observed that the number of subscribers furnished by the last four individuals on the list are exactly the same, viz.: 45.—They are each, consequently, equally entitled to the highest of these four prizes, but for the sake of filling out the list, we have voluntarily placed their names in the order seen. These gentlemen must either make an equal division of the gross sum of the four prizes, to wit, $50, which will give them each $12·50, or some further time must be given them to obtain more subscribers, and so enter a limited competition for the choice. We should prefer to have them try to increase their lists, and for that purpose suggest that the time be extended to the 15th of February. It is a matter that they must settle among themselves; we recommend them to correspond together upon the subject, without delay, and notify us of their verdict.

The competition for these prizes has been thrown open to all alike. It is a remarkable fact that "Young America" has been completely distanced by Canada,—the first time, we believe, that such a thing was ever known. It speaks well for the enterprize and intelligence of our vigorous neighbors of the North. Throughout the whole domain of Canada the SCIENTIFIC AMERICAN *passes free of postage*, although we are obliged to pre-pay 26 cents per annum on each subscriber, to pass them to the line. A wise enactment of the Canadian Parliament provides that all publications of a scientific and useful nature, shall go free, no matter where they come from.

The good effects of this law are being sensibly felt. The circulation of valuable publications in Canada has wonderfully increased since the passage of the act, now about three years since, and, as a consequence, the people are beginning to make rapid strides in knowledge and enterprise. It may be well for our own legislators to consider the propriety of establishing similar postal reforms.

To all who have lent their aid in endeavoring to promote the prosperity of our journal during the late canvass, we return our sincerest thanks. Whether they have taken prizes or not, one thing is certain, their labors have not been thrown away; they have worked for a good purpose—nothing less than the diffusion of useful knowledge—and they have accomplished noble results. Thousands of new readers are added to the SCIENTIFIC AMERICAN host. With the highest wishes for their success and advancement, we wish them all a "Happy New Year," and remain, as ever, their friends to command.

The Quality of American Wool.

The statement has been propagated far and wide that American wool is unfit to give that beautiful finish required for broadcloth of the best quality. It has been stated that our wools were longer in the staple than the foreign kinds, and were excellent for making strong warps, but did not possess the necessary felting property requisite for fine cloth, and for this reason a little foreign wool was necessary.—H. C. Merriam, in the last number of the *Country Gentleman*, scatters all such assertions to the winds, and proves conclusively that American wool surpasses all foreign wools for its *felting* properties, and for making beautiful broad cloth—light or heavy. He states that American grown wool and fine wool from Saxony have been tested, and the palm awarded to the former. The finest Saxony wool obtained from Hungary contained only 2400 serrations to the inch, while wool obtained from samples of American flocks contained 2552 serrations to the inch.

Water Descending and Hot Air Ascending.

A stream of water descending through the air tapers downwards, and at a certain depth divides into drops, because each particle falls with accelerated velocity, and at length (when it has overcome their cohesion) leaves the other particles behind it. But, when the stream is inclosed in a tube, this separation of its parts is prevented by the atmospheric pressure above and below keeping them together, and forcing the whole stream to flow with equal velocity; the lower part dragging the upper after it, while the upper (by its inertia) equally retards the lower, so that they move together with the mean of their natural velocities; and the discharge is, of course, more rapid than if there were no tube, and will be faster the longer the tube. Now, as the same is true of a stream of light fluid ascending through a heavier, this explains why the draught of a furnace depends on the hight of the chimney.

Back Numbers Volume 11.

The demand for back numbers of the SCIENTIFIC AMERICAN on this volume has been so much greater than we calculated for, that we can no longer furnish complete *sets*.

Of the 17 numbers issued, however, we can supply all except Nos. 6, 12, and 15. It is not probable that even this stock will long remain on hand. Those, therefore, who desire to obtain such back numbers as we have, should make early application.

Railroad Collision.

A terrible accident took place on the Ohio and Pennsylvania Railroad, near Darlington Pa., on the 31st ult., by which four persons were instantaneously killed, and eighteen severely wounded. It was caused by the collision of an express and a freight train in turning a curve. When will all our railroads be compelled to have double tracks?

Extinguishing a Burning Coal Mine.

The Pottville *Miner's Journal* states that efforts are being made to extinguish the fire in the Tamaqua coal mine, which has been on fire for some time. The method of extinguishing it is the same as that used in England, viz.: injecting steam and carbonic acid gas into the mine, then closing all the open spaces by which air has found an entrance.

The average duration of life in France is 36 1-2 years, in England it is 38 years; this is the highest of any country in Europe.

A New and Improved System of Numeration and Measurement.

(Concluded from page 134.)

After having contrived a system of numerating which would be, certainly, without defect, let us fix upon a system of weighing and measuring which will dispense with all useless irregularities, one which will be applicable to all materials, and meet all requirements, both ordinary and scientific. Philosophers have been much puzzled to fix a standard of weight and measure, and no natural standard is at present made use of; none has been found sufficiently perfect. Barleycorns, feet, grains, &c., vary too much. But there is in nature a very good standard for both weights and measures, a standard always at hand and easily employed. Such a standard is a drop of water—of distilled water—or rather a certain number of drops dripped from a small-mouthed phial. Upon this base we can form a table of liquid measures applicable to all liquid materials. Thus (10 stands for 8):

10 milistiles (from the Latin *stilla*, a drop)	1 centistile.
10 centistiles	1 decistile, or destile.
10 destiles	1 stile—the unit.
10 stiles make	1 dekstile.
10 dekstiles "	1 hekstile, (one teaspoon full.)
10 hekstiles "	1 kilistile, or kil.
10 kils "	1 Prote, (equal to four-fifths of a pint.)

The above table is rather for minute measurements. For ordinary requirements a decimal division seems to be too large. Prote is a Greek word signifying *first*, and would denote the most common liquid measurement, about an ordinary tumbler full. For ordinary use we could form a table of larger measurements, thus: (4 is half a double number here)

2 moits make	1 prote.
4 protes "	1 tesser.
4 tessers "	1 urn (3 1-5 pints.)
4 urns (1000 protes,) make	1 cask, (about 6 2-5 gallons.)

UNIVERSAL WEIGHTS.

10 millines make	1 centine.
10 centines "	1 decine.
10 decines "	1 stil, (the weight of a drop.)
10 stils "	1 decade.
10 decades "	1 hectade.
10 hectades "	1 kiliade, (1 1-2 ounces.)
10 kiliades "	1 litre, or weight, (full 12 ounces.)
1000 litres make	1 quarter.
4 quarters "	1 pas, (about 2,000 pounds.)

These tables are all framed upon the hypothesis that 8 and 9 are abolished, and 64 written 100, and 512 written 1,000.

Dry measure might be the same as liquid measure. There does not seem to be any reason for a special table. We have now given the measures for all solids and liquids, there remains then only to give them length and superficies. We can apply even here the base of one drop of water, but indirectly. The liquid measure is already framed upon it. We will take one prote of water in a cubic measure, and the quarter of one side will be the unit of measurement. This will be about 83-100 or 7-8 of one inch. In hydrostatic measurements it will be very convenient to have the relation between long measure and solid or liquid measure precise and well-known.

LONG MEASURE.

10 milimiters (milets)	1 unit, (about 7-8 of an inch.)
10 units	1 palm, (7 inches.)
4 palms	1 rule, (28 inches.)
10 palms or 2 rules	1 meter, (5 feet.)
10 meters	1 chain, (nearly 40 feet.)
100 chains	1 cast, (106 yards.)
1000 meters	1 kilometer or kile, (half a mile.)

By this table mechanics, surveyors, and engineers would make use of the same measurements—measurements much more convenient than our present ones.

SQUARE OR SUPERFICIAL MEASURE.

100 square units make	1 square palm.
100 " palms "	1 " meter.
100 " meters "	1 " chain, (about 1,600 square feet.)
10 square chains make	1 hortus, or hort, (about 1-0 of an acre.)
4 horts make	1 area, (about 1 1-5 acres.)

These make up the sum total of measurements, except that of time, and, upon examination will be found suited to all requirements. In the measurements of time we need a thorough change and simplification. In the first place, it would be a great convenience, if, knowing the day of the week, we could, from that, know the day of the month at any time. At present it is some labor to keep the run of the days of the month, as few commence on the same week-day, and some have 30 days and some 31, and February only 28, except leap-year intrude an extra day to still further confuse matters. There exists a widely-recognized authority for forming the week of 7 days—let us keep it so. The year consists of 365 days (written, new style, 555 days) and a fraction. We could form 13 months of 28 days each—4 weeks—leaving only one extra day to be brought in at the end of the year, thus making all the corresponding days of all months fall on the same day of the week. Leap year would occur twice in every *decade*, adding another day at the end of the year. An equinox or a solstice would be a proper time to commence the year; and as Christmas day is very near a solstice, and also very near the present beginning of the year, it would be fitting for a Christian people to usher in the new year on that day. It would be well, too, to make a new division of the day, making 64 seconds (pulsations) to the minute, 64 minutes to the hour, and 16 hours to the day. The table would then be:

(64) 100 seconds make		1 minute, (1 1-4 minutes long.)
(64) 100 minutes	"	1 hour, (1 1-2 hours long.)
(16) 20 hours	"	1 day.
7 days	"	1 week.
4 weeks	"	1 month.
(13) 15 months	"	1 year.

The hours thus being longer would seem to divide the day more perceptibly—they would be more distinguishable. The quarters would consist of 16 minutes (a decade) and be divisible by divisible numbers in *series*. The dial of a clock would consist of 2 decades; no returning to 1 o'clock, and no more confusing A. M. and P. M. It is not meant that clocks and watches should have 16 figures, perhaps 8 would be a more convenient number, but this would not prevent us counting to 16 hours without returning. The Romans, until lately, counted to 24 o'clock, yet had only 6 figures on their clocks. This made no confusion, every one learning to read the figure 1 for 7, 13, or 19, as these hours arrived. It would, probably be better to have only 8 figures—a decade—as a mere glance at a watch would be less mistakable. It is hard to refrain from further developments of this system as so many advantages from it crowd upon the mind; but it is to be hoped that these will suggest themselves to all thinking minds. At a first glance much that now exists would have to be changed, which seems discouraging, but a further glance will show the change would consist chiefly in destroying much that is useless. The new matter to learn would be little, and that little simple. J. M. Willcox.

Pennsylvania, 1855.

California.—Her Works and Ways.

Our California exchanges are neither few in number nor mediocre in taste and intellectual power. They are generally edited with great ability, and are well printed on good paper; they always contain much that is new to us on the eastern part of our continent. The following articles are abbreviated and collated from our exchanges—more especially from the San Francisco *Chronicle*.

Fortifications on Alcatraz, or Bird Island—This island lies about a mile out in the harbor of San Francisco. It is 140 feet high, one-quarter of a mile long, and 525 feet wide. It is a natural guard-house for the harbor, and is occupied by the U S. Government for that purpose, for it has high steep sides, accessible only in a few places.

The work of fortification was commenced in March, 1854; the amount of $466,000 was appropriated by Congress for the purpose.—There are to be three batteries on the northern, western, and southern sides of the island, to contain, in all, 43 guns, most of which will be 68-pounders. There will be a few 128-pounders and some 42-pounders. The largest-sized guns will throw a ball nearly a foot in diameter. Their range is said to be five miles. All the batteries are in *barbette;* that is, there is but one tier of guns, and they are uncovered—the carriages being protected by walls. The walls of the northern and western batteries are of brick; that of the southern battery is of stone. The last-named battery commands the city, and in the possession of an enemy might be used with terrible effect. It is guarded by a bomb-proof, case-mated battery—a very strong stone building, with walls and roof of solid masonry, many feet in thickness. This battery will have four very large guns looking down along and raking the barbette battery. Before the latter could be used by an enemy, the former would have to be taken. There is already erected on the island a light-house, in which a Fresnel light was placed on the 1st of June, 1854. The light is 160 feet above the ocean level, and may be seen at a distance of seventeen miles.

Tunnel Borer—The *Chronicle* gives the following description of a machine now being built in San Francisco for boring tunnels, and from the description we perceive that it is "Wilson's Stone Cutting Machine," which has been illustrated on pages 105 and 106, Vol. 7, Scientific American:

Gordon & Steen have at their foundry the model of a late invention for boring tunnels. No description would convey a clear idea of the machine, but we may say that the cutting is done by round plates of steel, about eleven inches wide by an inch in thickness, with a sharp edge. There are four of these plates which revolve upon a center, and are carried round and round in the tunnel, touching the rock at a low angle. The machine has been tried in the hardest New England granite. An engine of sixteen-horse power will be needed to bore a five and a half feet tunnel. At present the purpose is not to sell the machines, but to form a company for boring tunnels, and bore them at a certain price per foot.

Geology and Scriptures.—Dr. W. O. Ayres recently delivered a lecture on the above subject before the San Francisco Young Men's Christian Association, in which he gave the following interpretation, (as reported by the *Chronicle*) of the first chapter of Genesis:

"The Bible had been formerly interpreted to mean that the earth was only six thousand years old, but the science of geology proved beyond a doubt that the world had existed for many millions of years. This fact was proved by the structure of the rocks, to be found beneath the surface of the soil. To account for the apparent discrepancy between the Bible and geology in regard to the age of the world, it has been advocated that where Genesis said the earth was created in six days, the meaning was in six periods, each of which might have been thousands or even millions of years long. This theory has long been received as the correct one, but the lecturer was satisfied that it was incorrect.

"Genesis speaks of only three days wherein organic beings were created upon earth, the vegetable kingdom being called into life first and then the animal kingdom. Now geology showed plainly that a portion of the animal kingdom, residing in the water, had been created long before the vegetable, and these animals were numerous beyond conception and singular in species, there being many tribes of lizards and kindred animals which grew to be one hundred and fifty feet long. After these animals had been destroyed, as their remains still existing in the rocks testify; the first traces of vegetable life appear in the coal. These facts contradict the theory that the word day, as used in regard to the periods of creation, means a long series of years. The true interpretation of the phrase in Genesis, 'In the beginning God created the heavens and the earth,' was that millions of years ago God created the world, and formed the ancient animals. The second verse of Genesis says, 'And the earth was without form and void.' This, says Dr. Ayres, means that the Almighty, after having allowed the earth to exist for many ages with its fishy inhabitants, suddenly killed off all animal life, and then created light and the planets, and the animal and vegetable kingdom, as they now exist, within the six days as recorded in the first chapter of Genesis. The phrase that 'the earth was without form and void,' means that the earth was rendered empty and desolate, and only afterwards was the world rendered fit to become the residence of man."

This is the theory first clearly taught by Dr. Chalmers, but is now rejected by Hugh Miller and other eminent geologists. Dr. Ayres is a distinguished naturalist, and the lecture room was crowded to hear his lecture.

Recent Foreign Inventions.

Harris's Patent Steam Purifier.—The principle and operation of these steam purifiers consists in arresting a considerable amount of water and mud, usually proceeding with the steam from boilers, and particularly when driven hard, forming deposits which are detrimental to the effective working of steam engines, by causing a large and unnecessary amount of friction, as is well known to engineers. Now, by preventing this useless and destructive friction in the cylinders of engines, less steam would be required for accomplishing any given amount of engine work; and, of course, less fuel would be consumed, less burning of boilers, and less wear and tear of apparatus generally. When purified steam is used, 1 lb. of tallow will be much more effective in abating friction than 10 lbs. where water and mud are driven over with the steam, for the elements of mud, particularly should there be much alumina or magnesia in it, will form a sort of soap, ore mulsion, with the tallow, thereby causing it to be readily washed away at the temperature of steam engines, when in proper work. —[London Mining Journal.

A New Water Motor—G. A. Hubbart, Esq., of Brynkir, England, has recently obtained a patent for the following method of applying the power of water. It is described as follows by the patentee:—"By the discharge of an overshot stream of water into the endless chain of buckets greater power will be maintained than if the water were caused to act upon an ordinary bucket water wheel, and this power I propose to employ in order to rotate a bucket wheel, and by that means lift the water that has been discharged by the endless chain of buckets."

[This water motor is equal to any perpetual motion ever invented. The water is first applied to a series of buckets which rotate a wheel that pumps back all the water, so that the same quantity of water can do an infinite amount of work. Good for the year 1855.

New Stove—E. Myers and J. W. Potter, of Rotherham, England, have obtained a patent for a stove which has two chambers, a combustion chamber, which may be heated by gas or other means, and a heat chamber, which is placed immediately above it. Within the latter is fitted a conical reflector, having its apex downwards, by means of which a portion of the heat from the chamber below will be thrown down on to the floor.

New Use of Spent Tan Bark—Thomas Horton, of Birmingham, England, has obtained a patent for submitting spent tan bark to destructive distillation in a retort, from which he obtains pyroligneous acid as one of the volatile products, and charcoal as the remainder in the retort.

India Rubber Propellers—John Trotman, of London, has obtained a patent for making screw or submerged propellers of gutta percha, or vulcanised india rubber!

Our Patent Office generally refuses to grant patents for the application of a well known substance or substances to a new purpose, but it is very different with the English Patent Office. The application of well-known substances to new purposes, to produce useful results, is a patent in principle, and has been sustained at law again and again. It would materially redound to the credit of our Patent Office if more liberality were exhibited with regard to this class of inventors.

Draining of a Sea.

The Chairman of the Commission on the Draining of the Haarlem Sea in Holland has published a final report on this work, which is to be finished this year.

TO CORRESPONDENTS.

R. S. H., of Ohio—Chloroform dissolves gutta percha. If you take a solution of it, and filter it beneath a bell glass to prevent evaporation, the solution will pass through the filtering medium perfectly clear, and almost colorless. Then evaporate the chloroform, and you will obtain white gutta percha. You also wish to know how it can be rendered "hard?" Why it is a hard substance when kept below a temperature of 60 degs. It can be made as hard as wood, however, by kneading it with chalk and ground sulphate of magnesia, then heating it up to 212 degs.

L. S. U., of Tenn.—We think that the black paper used by manifold letter writers would answer your purpose in imparting a black impression of the stamp to white paper. You will find it in almost every stationary store. Paste on your stamps with a solution of gum arabic instead of wafers. You can carry it about in a small vial.

J. E., of Md.—Ground limestone is not equal to quick lime for agricultural purposes, because the latter has alkaline properties. Any device which has been in public use, with the consent of the inventor, more than two years prior to the time of making application for a patent, is an abandonment of the invention, in the eye of the law, as we understand it. There is no patent, to our knowledge, on he spring blade of the common apple parin machine. In the descriptions of knitting machines given in our reports of the late Fair of the American Institute, you will obtain all the information we can give you in answer to your particular inquiry.

G. H. S., of N. H.—We have carefully examined the sketch of your alleged improvements in water wheels, and we are of the opinion that the peculiar manner of constructing the floats possesses novelty sufficient to warrant an application for a patent: we have had a good deal of experience in water wheels, and have never before seen the same contrivance; as to its practicability, we have some doubt, but this point can only be determined by test.

L. H., of Pa.—There is nothing patentable in the mere employment of a separate engine and boiler to drive a blower, and nothing new in the application of a blower to a coal-burning locomotive. Your only chance for a patent is on some new arrangement of the boiler or engine, or some new features in their details.

T. D. H., of Ohio—We have carefully examined the sketch of your alleged improvement in rotary pumps, and we fail to discover in it novelty sufficient to justify an application for letters patent: we have had sketches of pumps of this character before, and therefore we do not think you stand any chance to procure a patent on yours. We have not a number of the paper referred to, to send you.

E. G., of N. Y.—You had better not send in the petition against the re-extension of the Woodworth Patent until Congress is organized. Get all the names you can to the pet tion, before that time. We hope all who feel interested in opposing this monopoly will act earnestly and vigorously in resisting it, and there will not be much fear of the result. The remonstrance in our office is rapidly filling up with good names.

R. S., of Mass.—We cannot tell you how to render glue soft without water, or other substance, that would not render it liable to shrink after it becomes dry.

S. R. W., of Ill.—We think your alleged improvement in windmills contains the subject matter of a patent, but you must bear in mind that a great deal has been done to improve the windmill, hence the chances are less encouraging.

L. D. S., of Mass.—The theory of your invention, as stated in your letter, may be perfectly correct: we are not sufficiently familiar with medical science to enable us to decide, but it would do no good to present an exparte statement of its value while the application is pending. If the case should be rejected, the testimony of medical men would be valuable to you, providing the Office should take the ground that the invention is pernicious, which it ought not to do.

G. R., of Mass.—Adjustable vise jaws have been made and patented, capable of grasping substances of unequal thickness: we do not know what your plan is, for doing this, but it may be different from all others.

E. M., of Ct.—Swedish iron, undoubtedly, yields the best quality of steel, much superior to English iron, and we believe the best specimens of English cutlery are made from it.

"Publicity's" ideas are very good: we now make place in this column for all the wants that come to us, which we are not able to answer readily.

P. I., of Pa.—Crosby has succeeded in getting the patent on his mill for re-sawing boards extended from seven years from last November. You cannot, therefore, use it without liability to him.

E. G., of N. Y.—We are very much pleased with your good opinion of our articles upon the art of dyeing. They were written by one of the editors of this journal from practical experience.

N. O. J., of N. Y.—We do not think a patent could be secured for merely casting projections to the outside of stove plates, for increasing the radiating surface: it does not possess novelty of a patentable character.

G. A. B., of Min.—Your inquiries about brick making are n t sufficiently specific to enable us to understand precisely what you want.

J. L. B., of Ohio—We do not think a patent can be secured on the washing fluid. In order to obtain a patent on a composition of matter, one of the ingredients must be new for the purpose, or if all are known, then they must be combined so as to produce a new result, which does not appear in this instance to be the case.

J. T. P., of Mo.—The radiator referred to in your letter was for a while in use in our office, and it operated tolerably well: the water was carried off through a pipe at the bottom of the radiator: we abandoned it for the reason that we could not get sufficient heat from it to warm our offices. We do not know whether the inventor is engaged in making them now or not.

W. P. T., of N. Y.—A modern work upon millwrighting cannot be produced; such a work is no doubt needed, but no one seems willing to incur the risk of its publication.

A. G. A., of Ill.—We are not acquainted with any work that embraces matter upon monumental designs. We think there is no such work.

G. B. A., of La.—The article on wire fencing has entirely passed from our minds, and we are therefore not able to point it out to you. Examine your files of the paper carefully and you will find it.

W. W. H., of Va.—A patent could not be obtained for drawing water from great depths in the ocean, to obtain a denser brine for making salt.

C. S. Smith, of Portsmouth, Ohio—wishes to procure a machine for punching the eyes of axes.

C. A. C., of Mass., writes us:—"Will you please to inform me if superfluous hair can be permanently removed by being pulled out with tweezers. Or the best method of removing it."

If our correspondent is careful to pull the hairs out *by the roots*, the cure will probably be permanent. We recommend him to try the operation. If not successful he might find the use of *sand paper* a better method. The rubbing should be continued long enough to remove not only the hair, but the skin through which it grows.

G. R. P., of Phila.—At present we are not acquainted with a solution that will give the metal you mention a red appearance.

A. T., of Montreal.—We do not intend to destroy the Benzole apparatus to which you refer.

A. B., of N. Y.—Your marble sawing machine does not embrace anything new or patentable, and unless you wish to get into a sea of troublesome litigation, you had better back out of the scrape. There is no chance whatever for you to obtain a patent unless you can ante-date a great number of applications already pending in the Office.

M. S., of Ill.—We have received your letter, and will wait till you come to the city to have your explanations respecting the valve motion.

H. B., of Ind.—We could not tell you the amount of wind pressure on a body moving with one-third less the velocity of the wind, unless we knew what the velocity or the pressure of the wind was; whether driven by a fan, or merely by the motion of the atmosphere. Much ignorance exists respecting the velocity and friction of air passing through long tubes. A series of experiments by some spirited person would be a great boon to science.

J. M. H. of Ill.—You will no doubt experience a saving in fuel by heating the air before it enters the furnace of your boiler, using for this purpose a pipe running partly through the chimney and then under the ash pit; but the plan is not patentable, it has been used before. A ten inch pipe should give you sufficient air for combustion.—You ought to use a damper in the flue at the chimney throat, and if you have not a fire-bridge under the boiler erect one as soon as possible.

A M., of N. J.—We are unable to inform you what horse power uses octagonal or hexagonal rollers. We have never noticed the shape of the rollers employed on such powers.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, Jan. 5, 1856:—

E. A., of Conn., $25; S. & H., of N. J., $250; J. B. E., of N. Y., $12; H. N. DeG., of N. Y., $30; W, H. C., of O., $30; M. & W., of N. J., $30, J. P. S., of Vt., $50; H. & M. K., of Mass., $55; W. B. K., of Mass., $30; H. & C., of O., $400; E. W., of N. C., $25; J. S. T.. of Conn., $30; A. P. C. of N. Y., $25; A. N. T., of Pa., $35; W. & B., of Me., $10; R. K., of Mass., $100; D. H. T., of Mass., $30; J. H. B., of N. J., $100; L. & W., of O., $16; G. & H., o N. Y., $30; J. R., of Pa., $30; H O'C. of Texas, $25; W. H., of N. Y., $30; G. W. B., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Jan. 5:—

M. M., of La.; E. W., of N. C.; R. L. & A., of N. Y.; S. & C., of Wis.; G. W. B., of N. Y.; A. P. C., of N. Y.; E. A., of Conn.; L. & W., of O.; H. O'C., of Texas; H. C. S., of N. Y.

Important Items.

GOING RAPIDLY—The back numbers of the present volume are fast being exhausted, and those who desire the numbers of Vol. 11 complete, must not wait much longer before remitting their subscriptions, else they will be disappointed.

MODELS—We shall esteem it a great favor if inventor will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

Subscribers or exchanges who are entitled, to the paper and fail to receive it regularly are desired to inform us that any omission may be corrected. Missing numbers are furnished gratuitously where the fault rests with the publishers.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and enclosing $1 as fees for copying.

Literary Notices.

BLACKWOOD'S MAGAZINE—The December number of this prince of European monthlies, completes the forty-first volume, and is as fresh, vigorous, and racy, as in its youngest years. True, Scott Hogg, Maginn, and Wilson, its famous contributors, are no more, but it still employs the finest intellects of Great Britain, as contributors; "Zaidee," is completed in this number: its author is believed to be Bulwer. Now is the proper time to subscribe for this magazine. Leonard Scott & Co., No. 54 Gold st., this city, are the publishers.

AMERICAN JOURNAL OF EDUCATION AND COLLEGE REVIEW—This is a new magazine, published by N. A. Calkins, 348 Broadway, this city, and is edited by Absalom Peters, D. D., and H. Barnard, L.L.D. The number for this month—the second issue—contains a fine steel plate engraving of the late Hon. Abbott Lawrence. Some of the articles contained in it display uncommon ability, especially the one on the "Democratic Tendencies of Science," by Prof. Olmstead. This magazine will no doubt be well sustained by the Professors in colleges, teachers in schools, and by students in general.

THE KNICKERBOCKER.—Old "Knick" is unusually rich this month. The first article is on "Pleasant Memories of the Old World," by James W. Wall, and describes very minutely old "Holyrood Palace," and the terrible scenes transacted there during the reign of the beautiful Queen Mary. The other articles and poetry (nineteen in number) are capital. This magazine has an originality about it peculiar to itself, it possesses more literary individuality than any of our magazines, especially the editorial department—there is nothing like it anywhere. Published by S. Hueston, No. 348 Broadway.

THE UNITED STATES MAGAZINE, for this months, opens with an article on "Indian Corn," which is ably written and well illustrated. A very fine illustrated article on the progress of art in our country does credit to its author. This magazine now sustains a very excellent reputation. It is published by J. M. Emerson & Co., Spruce st., this city.

THE MINING MAGAZINE—Edited and published by W. J. Tenny, 98 Broadway, this city, contains a long article on the Iron Manufacture of Great Britain, by Wm. Truan, C. E., who has recently written a work on the subject, which has been published in London. Some of the statements of this author have been disputed in England by Prof. Noad; Mr. Truan, however, is acknowledged to be well acquainted practically with manufacturing iron. This magazine is devoted to mines, mining, and metallurgy, geology, and is ably edited, and contains a great amount of very useful information upon every subject to which it is especially devoted.

Science and Art.

Cochineal.

The French, it is said, are now cultivating the cochineal, successfully, in Algeria. This insect, originally, belongs to old Mexico, from which country, it was first brought to Europe by the Spaniards. Its use is to dye a scarlet color on silk and wool, and it has entirely supersede the old *kermes*. This insect is a *bug* —the cactus amphidia. In Mexico and Honduras, immense fields of cactus are cultivated. Every pound of cochineal is composed of about 70,000 insects.

The cochineal secretes a white cotton-like substance which envelopes it on the plant it lives on. There is nothing more simple than the way the harvest is made. The insects are made to fall into a basin by means of a dull knife, and are then plunged for a few minutes into a vessel of boiling water, and are afterwards placed on a sieve and exposed to the sun for a day and a half.

The insects are then completely dried, and look like little wrinkled seeds of a purplish gray color. It is in this state that they become an article of merchandise.

To dye a scarlet on wool, the cochineal is ground fine, and boiled with cream of tartar, and the chloride of tin in a kettle, for five minutes, then the wool is introduced and boiled for about an hour. That beautiful pigment —carmine—is made of this Mexican bug, boiled in a weak solution of alum, then strained through a cloth, and the fine precipitate dried in cakes.

Preparation of Colcothar.

Sulphate of iron is dissolved in boiling water and filtered; concentrated solution of oxalic acid is added as long as a precipitate continues to be formed. When quite cold the liquid is filtered through linen, and washed on a cloth as long as the water shows an acid reaction. When partially dry, it is heated on an iron plate over a small fire. At 392 deg. Fah. the decomposition commences; and on raising the temperature still higher, red oxyd is formed in the finest possible state. This colcothar, without any washing, may be employed for polishing plate-glass, lenses, gold and silver, daguerreotype plates, concave mirrors for reflectors. By using this preparation the polishing of glasses may be greatly quickened.—[London Artizan.

Oxyd of Tin as a Polishing Powder.

M. Vogel prepares a solution of tin by pouring six parts of boiling distilled-water on one part of the commercial chloride. The solution is strained through a cloth into a glass vessel. A concentrated solution of oxalic acid is added to the liquid while still hot. When cold, the clear liquor is decanted, and the precipitate washed with cold water upon a linen cloth, until the rinsings no longer affect blue litmus. The oxalate thus obtained is dried and heated on an iron plate over a small charcoal fire. At a red heat decomposition commences; carbonic acid and carbonic oxyd are given off, and peroxyd of tin remains in a state of minute subdivision. During calcination the matter should be constantly stirred; and it increases very much in bulk. We obtain 1 lb of oxyd from 2 of chloride of tin and 1 lb. of oxalic acid. The oxyd thus prepared is found admirable for polishing optical glasses, metals, &c., &c.—[Ib.

Milk of Wax for the Skin.

One of the best cosmetics for the skin is milk of wax; it is simple in its composition, all the ingredients being perfectly harmless or non-medical, therefore its daily use will not produce any future injurious effects. Take virgin wax, oil of sweet almonds, spermaceti, and any fine white soap, of each a quarter of an ounce; rose water, or of elder flower water, three quarters of a pint; essence of lavender, or of real eau de Cologne, three ounces. Cut up the soap into very small pieces, and place them with about a wine-glassful of the water in a jug; put the jug into a saucepan containing boiling water, at the side of the fire; in a few minutes all the soap will dissolve in the water; when this is done, put into the jug the oil, the spermaceti, and the wax, stirring the whole well together as the wax liquifies. Now very gradually, little by little, pour into these ingredients the remainder of the water; then allow the whole to cool, and add the scented spirit; when perfume is not desired, plain spirits of wine will answer just as well as that which is called essence of lavender, &c. This operation done, the milk has only to be strained through book muslin to be ready for use. Yellow soap, and many of the common soaps, although very good for household cleansing purposes, are far too alkaline for use on "the human face divine;" hence many ladies reject the use of soap for the face altogether on account of its irritating qualities; those who do so will be much pleased with the emollient properties of the milk of wax.—[Piesse's Art of Perfumery.

Excessive Division of Labor Injurious.

The Philadelphia *Ledger* of the 2d inst. contains an article on the above subject, the substance of which ought to be scattered broad cast throughout the world. Its object is, to point out the injurious effects upon men and nations of doing one or two things in the most superior manner by excessive division of labor and limited exercise of thought, and to show the benefits of a larger area for labor and thought. It says:—

"The division of labor, though it may bring to perfection the production of a country up to a certain point, is most deleterious in its effects upon the producers. To make pins to the best advantage, it may answer for a time to divide the operation into twenty parts. Then each man will only have to consume the time necessary to learn how to perform the twentieth part of making one pin, before his labor becomes available. Let him concentrate the whole of his attention on the one simple work, for instance, of learning to make pin heads, and on this ever let his time be consumed. It is astonishing the perfection and rapidity which he will acquire in performing the operation. But what is the result upon the man? His powers of mind will dwindle, and his head become, for all practical purposes, after a number of generations, no larger than that of one of the pins that he makes. He ceases to be a man, and becomes a mere tool.

"Any person who has been familiar with the most prosperous farmers or mechanics in this country must have observed their immense mental and physical resources, and their superiority over the same class of persons from the older countries of Europe. In the more newly settled portions of the country, the fertility of resource and invention acquired by persons who have removed from the older States is very obvious in many occupations, so that the Western men have the idea that they are, as a class, 'Eastern men enlarged.'"

Price of Coal in England.

As regards the prices of coal in England, I have not been able to perceive any difference between the rates paid per tun in the London market and those paid in Philadelphia for Lehigh and Schuylkill. From 16 to 20 shillings, or $4 to $5 per tun is obtained in London for the best qualities. This is probably less than house coal is commanding at the present time in Philadelphia; but in making a comparison we must not forget the difference in the nature of the fuel at the two places. Barring the 'slack' with which the Pottsville folks in hard winters persist in encumbering the stoves and furnaces of their good easy customers of the Quaker City, the anthracite, which Pennsylvania alone of all the world, furnishes in any quantities, is decidedly more economical, producing a greater proportion of heat for the same expenditure of fuel, than the bituminous article which smokes and blackens the Cockneys so terribly. In the large towns of the manufacturing district, Manchester, Sheffield, Leeds, Blackburn, Bolton, Bradford, Stockport, &c., which are all situated in close proximity to the mines; coal is certainly very cheap being no more than from $2 to $2·50 per tun of house coals, and from $1·25 to $1·50 for engine coal. At Pittsburg, which city is in the heart of the Pennsylvania bituminous field, I believe the same species is delivered for 5 cents per bushel, equivalent to about $3·50 per tun, and this in the face of the fact that there are no shafts whatever with the expensive machinery necessary to work them in the Pennsylvania mines, all the workings being horizontal, and entered from the sides of the banks. —[Correspondent Pottsville Journal.

Extract of Indigo—Salts of Tin.

Messrs. Editors—I mean always to continue a subscriber to the Scientific American; I am by profession a dyer and scourer, and have gained more knowledge from your journal than all the receipts I ever met with. It would confer a favor on me if you would inform me how the "extract of indigo" is made, also the "salts of tin." M. Cassel.

Lafayette, Ind., Jan. 1856.

[The indigo is first reduced to an impalpable powder in a mortar. For each pound of indigo thus ground, six pounds of highly concentrated sulphuric acid, are put into a large stoneware jar. This is kept in as dry a part as possible, and the indigo is added gradually in small quantities, and care taken that the heat of the solution does not exceed 212 degs. Fah. When the indigo is all added, the vessel is placed in such a position that the heat may be kept at 150 degs. Fah., and allowed to stand, stirring occasionally, for 48 hours. It is then technically called chemic; and its quality determined rudely by painting a little of it on a piece of glass. The color it assumes on the glass affords evidence to the skillful dyer of its quality. Good chemic exhibits on the glass a few seconds after it is put on, a rich purple blue color. To make the extract of indigo now so common, chemic prepared as directed is then diluted with hot rain water, and the whole is put upon a filter of woolen cloth, by which means the insoluble impurities of the indigo are separated. The blue solution which has passed through the filter is transferred to a leaden vessel, and evaporated till reduced to about three gallons for every pint of indigo used. This is a pure extract of indigo, but that prepared for market has—according to Napier —the following also added to it, namely: "four pounds of common salt to the pound of indigo, and the whole is well stirred. The sulpho indylic acid is thus precipitated, and the whole is again thrown upon a similar filter of woolen cloth; the extract remains upon the filter, and when sufficiently drained is ready for the market. Some makers add a little potash or soda, which may be advantageous, and a little ammonia gives the extract a beautiful bloom. A pound weight of indigo should yield fourteen pounds of extract." The common "extract of indigo" is unsuited for dyeing dark blue and green shades on silk. Every jobbing dyer will find it to his advantage to make his own *chemic* "sulphate of indigo," and he should use only the best Bengal for this purpose. It requires the best of indigo, and strong pure sulphuric acid to make good chemic. The color of the best quality of indigo is a deep blue with a copper tinge. To select it, proceed as follows: break a cake, and examine its inner grain; if it is fine and of a deep blue shade, and exhibits a coppery metallic luster when rubbed with the finger nail, it is a very good sign that it is of a superior quality.

Salts of Tin—These as known in the art of dyeing, are a protochloride of tin. They are made by dissolving pure tin in hydrochloric (muriatic) acid at a heat of about 150 degs. Fah. The tin is fed into the acid, as is well known to all dyers, until no more can be dissolved. The solution is now known by the name of "muriatic tin spirits." If placed in a warm place the water will be evaporated, and crystals formed; these are the salts of tin. They dissolve in a small quantity of water; if put into a large quantity, the whole becomes milky, and a white powder separates, which is an oxychloride of tin. A clear and complete solution of salts of tin in water cannot be retained for any length of time, on account of the great attraction which this salt has for oxygen. A little hydrochloric acid put into the water, however, has the effect of greatly retarding, and, indeed, of almost wholly preventing their decomposition. It is the best plan for jobbing dyers to use the muriate of tin, and not the *salts*, if they wish to keep "spirits" on which they can place the utmost dependence.

Lake Superior Iron.

Vast stores of the purest iron ore in the world are found in the Lake Superior regions. During the past year 1400 tuns were shipped by the Cleveland Co., and more than 50,000 tuns could have been sold. Great preparations have been made for shipping vast quantities of it next season, and it is calculated that in three years from the present date, no less than 200,000 tuns will be mined and shipped in one season. It makes beautiful iron, of the best quality.

A Great Steamship Company.

"The Peninsular and Oriental Steamship Company," in England, is the richest and most powerful in the world. A report of the yearly meeting of the stockholders, contained in a recent number of the *London Mining Journal*, presents the astonishing fact that the Company owns 60,551 tuns of steamships, embracing 49 vessels, averaging 1237 tuns each. Some of these are very large, while others are of smaller dimensions. Twenty of them are propelled by the screw, the rest by paddle wheels. These vessels are running on nine different routes on as many seas, such as the Mediterranean, the Chinese sea, between England and Egypt, France and Malta, &c. Its affairs must have been well managed last year, and the Company must possess careful and able officers, engineers, and seamen. Forty-two of their steamers had run 2,000,000 miles without a single accident. If any of the Company's employees get injured by accident in their service, they get the same pensions as those given by the government to persons in the Navy. At Southampton there is a large school maintained to educate the children of their employees, and at present there are 340 children receiving instruction in it. The yearly dividends amounted to ten per cent., last year being one of great prosperity, owing to the demand for vessels caused by the war in the Crimea.

Gentility is neither in birth, wealth, manner, nor fashion—but in the mind. A high sense of honor, a determination never to take a mean advantage of another, an adherence to truth, delicacy, and politeness towards those with whom we have dealings, are its essential characteristics.